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THE AVICULTURAL SOCIETY

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EDITORIAL

One of my most enjoyable annual writing assignments is compiling a review of zoos and bird gardens in Britain for two IPC publications, *CAGE & AVIARY BIRDS* and *BIRDKEEPER*. The theory each year is that the people in charge will mail or fax me the latest news of what is happening in their particular collection.

However, in about 70% of cases, theory is not translated into fact and I invariably have to spend the better part of two or three days telephoning around Britain for information needed urgently to meet editorial deadlines.

It is always a rewarding exercise - hearing of new arrivals and interesting breedings, and perhaps most of all of people's hopes and ambitions for another new season.

There are some quite excellent public collections in the UK and they share many interesting exhibits. Sadly there is an understandable reluctance on the part of many to provide details of species known to be especially vulnerable to that modern predator, the bird thief.

But thieves are unlikely to trouble two new arrivals at The National Birds of Prey Centre at Newent in Gloucestershire. A juvenile pair of Steller's Sea Eagles *Haliaeetus pelagicus* arrived there a few weeks ago from Moscow. With a spectacular pair of Martial Eagles *Polemaetus bellicosus* already in the collection, Director Jemima Parry-Jones now has a formidable 'big two'.

At Pensthorpe Waterfowl Park in Norfolk, wildfowl enthusiasts can admire a number of rarities - Pink-eared Duck *Malacorhynchus membranaceus*, Harlequin Duck *Histrionicus histrionicus* and Freckled Duck *Stictonetta naevosa* to name but three.

Australian Brush Turkeys *Alectura lathami* are an interesting feature in the collection at Lotherton Hall Bird Gardens in Yorkshire, while across the Pennines in Lancashire a breeding group of Western Slender-billed Corellas *Cacatua pastinator* are a highlight.

Spectacular exhibits at Flamingo Gardens and Zoological Park are large groups of several species of pelicans (three species were incubating recently). In conversation with Christopher Marler a few weeks ago, he confirmed that he hoped soon to have all eight of the world's pelican species in the park in the near future.

There are other interesting and unusual birds held in British collections - Roadrunner *Geococcyx californina* at Banham in Norfolk, where a first UK breeding of the species has been achieved. In Berkshire there are 20 species of laughing thrushes in Beale Park's collection where more than 70 young birds have been reared successfully during the past three years.

The Avicultural Society has a number of members who are much involved with the running of some of these establishments, either as Curators, in other staff posts or, in some instances, as owners.

There is almost certainly a zoo or bird garden within reasonable travelling distance of most UK members. Many are regular visitors - others turn up less frequently. If you are part of the latter group, let me persuade you that you don't know what you are missing. People such as Council Members Roger Wilkinson (Chester Zoo) and Mike Curzon (Tropical Bird Gardens, Rode), and Peter Player of Flimwell Bird Park in Sussex, would certainly confirm that!

F.W.

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MAINTAINING PARAKEET AUKLETS, AT THE CINCINNATI ZOO & BOTANICAL GARDENS; HAND-REARING PROTOCOL WITH DEVELOPMENT AND BEHAVIOURAL OBSERVATIONS

By David A. Oehler, Susan C. Schmid
and Matthew P. Miller

Abstract

Parakeet Auklets *Cyclorrhynchus psittacula*, were collected as chicks on St. Lawrence Island in 1993, for the Cincinnati Zoo. The burrows in which the Parakeets nested were well dispersed along the talus slopes and cliffs and offered protection from predators such as Arctic Fox *Alopex lagopus*. The Parakeet chicks were reared in artificial burrows and adapted to being fed Krill *Euphausia superba* and Sand Eels *Ammodytes hexapterus*. A mean weight of 216 gr. was obtained at fledging while food intake decreased to 28% of body mass, at that time, from amounts of over 40% in ages estimated up to 15 days. Measurements and weights were recorded on the sub-adults (N=22) at one year of age; mean weight: 236 gr., measurements, mean wing span: 48.6 cm and mean length: 26.0 cm First year plumage varies from 30% of the colony transforming into typical adult plumage, 50% intermediate transformation and 20% remaining in the typical juvenile form.

Introduction

Alcidae are distinguished among charadriiforms by their compact form, short wings and feeding habits (Cones, 1868), *Cyclorrhynchus* are further defined by the reduction of the lateral sternal notch to a fenestra, six costal processes on the sternum and nesting in natural crevices (Strauch, 1985).

In this monotypic genus the Parakeet Auklet, once known as "parquet", is found. The sexes of this species are alike marked by seasonal variations. During the breeding season this auklet's head is sooty black with mottled whitish throat and foreneck. A yellowish auricular streak runs from the eye to the ear. The sooty black colour continues onto the upper back with the underparts being mostly white, while the transitional areas of the breast and flank are mottled gray. The tail is black and the bill is upturned and red. Non-breeding plumage changes to a mottled white area on the chin and throat while the bill becomes a dull brownish-red (Harrison,

1983). The chicks have down that is very fleecy and dense. This down ranges in length from 7 mm in the capital tract to 16 mm on the dorsal region. The iris is black and the bill is grey with a white egg tooth on the upper mandible. At 30 days of age the chicks have obtained the white superciliary line from the eye to the ear, although the feathers are not elongated. The iris has become bluish grey and the bill is pale black with a yellow mouth cavity (Bedard & Sealy, 1984).

The range of the Parakeet Auklet overlaps that of the Least Auklet *Aethia pusilla* and the Crested Auklet *A. cristatella*. In Russia these birds are reported to breed on seashore cliffs and in the winter wander the seas, keeping clear of frozen seas. Parakeet Auklets breed along the shores of the Chukotskiy and Kamachatka Peninsulas, the Sea of Okhotsk, Commander and Kuril Island. In winter it can reach Japan. The breeding range continues along Cape Lisburne on the Bering Strait south through the Bering Sea including St. Lawrence, Pribilof and Aleutian Islands, then east through the Kodiak archipelago as far as Prince William Sound (Freethy, 1987). Parakeet Auklets nest deep within the rubble of talus slopes and in cracks and crevices on rocky shorelines or cliffs. The colonial tendency is seemingly less strong than in other Auklets. The pairs nest in scattered groups or in solitary pairs (Sowls et al, 1978). In each nest a solitary white egg is laid (Peterson, 1961).

These auklets avoid strong pycnocline gradients, thus are presumed to have greater diving abilities than the Least Auklet (Haney, 1991). This conclusion may need further study since gelatinous zooplankton (e.g., jellyfish and ctenophores) is an important part of the Parakeet Auklet's diet and probably are their preferred foods. The primary reason for feeding on jellyfish may be the high nutritive value of associated crustaceans and fish larvae; hyperiid amphipods and fish larvae are easily observed on and around jellyfish in the surface waters (Harrison, 1990). These items are important to the auklet along with other seabirds due to the fact that they have a unique capacity for assimilating wax esters with higher efficiencies (>90%) than that attainable by mammals (<50%) (Place, 1992). The Parakeet Auklet's bill is highly specialized and unusual in that the lower mandible is a narrow hook that curves up and around the blunt mandible, suggesting these birds hook gelatinous animals or pick zooplankton from medusae/jellyfish (Harrison, 1990).

Parakeet Auklets also occur in areas of the eastern Bering Sea where Least and Crested Auklets are absent (Bedard, 1969). Par-

akeet Auklets consistently had larger reserves of subcutaneous fat than the other *Aethia* species. Parakeets display less annual variation in breeding success and would appear to have a dependable supply of food (Harrison, 1990). The Parakeets also have been observed to have less mortality due to predation by fox than other auklet species. While the Least and Parakeets were nesting in the same area of St. Lawrence, Least was observed being taken by one pair of Arctic Fox at a rate of up to 10 per hour during daylight hours, while the parakeet Auklets remained undisturbed (Drischman, 1993).

Methods

In August 1993, staff members of the Cincinnati Zoo and Wildlife Concepts International set up collecting operations, of the Parakeet Auklet, in the village of Savoonga (63°42'N, 170°30'W) on St. Lawrence Island. Seabirds were observed along Punelok Bay and on Cape Myaughee where the colonies had been estimated at up to 100,000 birds and 1,000,000 birds respectively (Sowls, et al 1978). Collection of 28 juvenile birds began on 20th August 1993 and were held in Savoonga until the departure date of 25th August. All chicks were hand fed krill *Euphausia superba* four times a day.

Transport of the birds to Cincinnati was accomplished through air charters and commercial flights which hastened the journey and limited the time that each bird had to remain in the crates. Once the birds arrived at the zoo they were placed in brooders within a specially prepared holding facility where further observations were made on growth patterns by taking daily weights, morphology changes through photo-documentation, daily food intake by recording items ingested until each bird fledged and behaviour patterns through daily observations and video documentation.

Results

Collection

The Parakeet Auklet nests were found by climbing down over the cliffs of the colonies and searching crevices by hand or with flashlights. Nest-sites were discovered above the tide line at the base of the cliffs up to the top of the ridge. Unlike the other auklet species encountered, the Parakeet Auklets did not nest in large numbers in any one area, preferring to disperse their numbers along larger tracts. The typical nest found on the cliff face was a cavity large enough to accommodate the auklet's body size and provide security by having a chamber up to one meter in length. Occupancy of a cavity was foretold by a small amount of "white wash" at the entrance and the accumulation of feather sheaths, from the chick's

feathers as they opened, which formed a grey dust along the burrow floor. Nest-sites within the boulder rubble were more difficult to locate, due to the many crevices formed by the mass of rocks. In these areas the nest size was comparable to the cavities found along the cliff face although the preferred sites usually had one entrance that branched off into several diverging tunnels. Observed mortality within the colony could only be attributed to rock slides trapping adults within the nest cavity, no evidence of predation was noted.

Once the chicks were removed from the nests, they were taken to the holding facility in Savoonga to be maintained until their extraction to Cincinnati. Each chick was housed in separate compartments that remained darkened. An ambient temperature of 45° to 55° F + - 5 degrees surrounded the crates for the duration of this period. Each chick was tubed with a pureed mixture of krill four times a day. After several days the chicks began to take whole krill by hand and the tubing was discontinued.

Rearing

Upon collection, each chick was placed in an individual compartment of a holding crate for hand-rearing. Ambient temperature was maintained at 55°F + - 5 and moss collected and dried from the surrounding area used as a substrate. Initial food intake was offered via a feeding tube with a formula of krill (placed through a blender until liquefied) four times a day over a twelve hour period. The average age of the chicks at the time of collection was estimated at 12 days. The chicks quickly tamed down and began to take krill by hand within two days of being collected, the morning feeding of blended krill continued (See Table 1).

The holding facility in Cincinnati was readied prior to receiving the alcids from St. Lawrence. Brooders were constructed measuring 4ft x 8ft divided into eight equal 1ft x 4ft sections with an open top and 1in welded wire bottom. Within each section two cardboard boxes, one foot square and waxed on the inside, were placed in the centre dividing the section into two areas. The cardboard boxes had a three-inch hole cut in the front and a flap cut in the top to be used as a lid. Medical (disposable) underpads were used to absorb any faecal matter not ejected through the entrance of the artificial burrow. The holding facility was maintained at 55°F and the air was constantly filtered, removing all particles larger than three microns. The water system utilized UV sterilizer units, a cooling system that regulated the water at 45°F and a filtration system of Jacuzzi, DE and Zeolite filters. A rate of three gallons of water per

minute was injected into the thousand-gallon pool to create an overflow to reduce surface oils. Lighting was achieved through eight banks of 400 watt sodium vapour and metal halide fixtures and controlled via a timer that maintained the bird's natural photoperiod throughout the year.

A morning weight was taken on each chick and the four feedings per day continued along with the addition of Sand Eels *Ammodytes hexapterus* and vitamin supplements to the diet. The chicks were weaned onto a regimen of eating whole krill and fish placed on a plate within the entrance of the box. The process of eating off a plate began as the chicks approached 18 days of age and food intake was monitored closely. Based on body mass, the highest rate of food consumption was obtained within the first 15 days of age. Chicks would ingest between 31% to 45% of their body weight in food, up to 15 days of age and the quantity decreased to its lowest point prior to fledging at 23% (See Table 2). As the juvenile birds advanced toward 30 days of age and fledging they would begin to spend time at the entrance of the box or venture outside of the box entrance. Upon fledging the juvenile birds' appetites increased and they were consuming 28% of their body weight in food per day. Rocks were introduced into the brooders to allow the birds access to a substrate other than wire.

After the plumage was completely developed and the chicks' down feathers were replaced, the birds were introduced to open water. The first three days of the introduction occurred for periods of six to seven hours and then the birds would be placed back into the brooders at night. Once it was observed that an individual was waterproofed and acclimating well to the new surroundings the bird would remain out in the main section of the enclosure. Food plates were placed in the shallow portion of the pool allowing the birds, which spent a large amount of time in the water, to become proficient at finding their food before the plates were relocated on the deck area. Blocks of frozen krill were floated on the water to allow the juvenile birds to forage in a more natural manner. The Parakeets showed less propensity for diving than the other alcid species housed in the enclosure at that time (Least Auklets, Pigeon Guillemots, Horned Puffin and Tufted Puffin) and further investigation of feeding techniques of these birds will be forthcoming.

As the birds matured, smaller and more numerous food plates were distributed around the enclosure to reduce the increasing amount of competition that developed. This competition coincided with the increased photoperiod and the onset of what would normal-

ly be the breeding season. While no breeding did occur in these sub-adults, there was increased usage of burrows (six inch PVC tubes) and pair bonds were established between several pairs. Defence of burrows and individuals bringing food back and feeding the other within the pair was observed.

Table 1:
PARAKEET AUKLET DIET

Beginning formula	Krill and Mazuri vitamins; blend until liquefied and fed through a syringe and tube.
Day 7 - 10	Four feedings per day over a 12 hour period. A.M. feeding consists of the krill formula. The next three feedings are krill and sand eel by hand.
Day 11 - 14	A.M. feeding limited to 10cc of krill formula. All other food offered by hand four times per day.
Day 15 - 17	Discontinue formula. All krill and sand eels offered by hand four times per day.
Day 18 - 21	Krill and sand eels given on plates four times per day. Known quantities given and intake monitored.
Day 22-30	Krill and sand eels given fresh three times per day ad-lib.
Day 31	Krill and sand eel given BID/ad-lib.

Morphology

The development of the Parakeet Auklets was recorded through a photographic register at intervals of 90 days. Colour bands on each individual's leg aided in tracking the general progress within the colony.

At an estimated age of 30 to 35 days, the chicks had lost all of their natal down, the last remaining portions being on the head and nape. At this point the plumage was developed sufficient for survival on the open water. The white superciliary line from the eye to the ear had been acquired but the elongated feathers were not observed until 90 days of age, as the birds underwent a partial moult. During this period of development the bluish grey iris of each chick changed to a pale yellow colour. The juvenile plumage pattern consisted of a moderate grey tone over most of the head and a light white to pallid grey under the chin and over the region of the nape toward the back. The breast and throat were solid white and the mandibles varied in standard although all were black with cream colour markings.

At eight months of age a portion of the colony began to obtain plumage similar to that of mature adults. The white mottled throat and chin with the mottled grey continuing around to the nape began

Table 2:

PARAKEET AUKLET DEVELOPMENT/FEEDING REGIME

Day *	Mean A.M. Weight (gr)	Diet	Number of Feedings per 12 hrs.	Amount Fed (mean/gr)	Vitamins
8	81	F/K/S	4	25.5 gr/day	Mazuri
9	89	F/K/S	4	34.0 gr/day	Mazuri
10	99	F/K/S	4	42.6 gr/day	Mazuri
11	100	10cc/F/K/S	4	44.7 gr/day	Mazuri
12	108	10cc/F/K/S	4	41.7 gr/day	Mazuri
13	116	10cc/F/K/S	4	48.8 gr/day	Mazuri
14	120	10cc/F/K/S	4	49.1 gr/day	Mazuri
15	126	K/S	4	49.8 gr/day	Mazuri
16	134	K/S	4	56.7 gr/day	Mazuri
17	146	K/S	4	44.3 gr/day	Mazuri
18	146	K/S	4	50.8 gr/day	Mazuri
19	168	K/S	4	50.9 gr/day	Mazuri
20	174	K/S	4	51.0 gr/day	Mazuri
21	185	K/S	4	48.6 gr/day	Mazuri
22	193	K/S	3	55.5 gr/day	Mazuri
23	199	K/S	3	57.9 gr/day	Mazuri
24	205	K/S	3	60.4 gr/day	Mazuri
25	308	K/S	3	60.0 gr/day	Mazuri
26	214	K/S	3	59.9 gr/day	Mazuri
27	215	K/S	3	48.5 gr/day	Mazuri
28	220	K/S	3	57.1 gr/day	Mazuri
29	215	K/S	3	60.6 gr/day	Mazuri
30	216	K/S	3	ad-lib	Mazuri
31	215	K/S	2	ad-lib	Mazuri
32	214	K/S	2	ad-lib	Mazuri
33	224	K/S	2	ad-lib	Mazuri
34	224	K/S	2	ad-lib	Mazuri
35	220	K/S	2	ad-lib	Mazuri
36	223	K/S	2	ad-lib	Mazuri
37	209	K/S	2	ad-lib	Mazuri
38	214	K/S	2	ad-lib	Mazuri
39	210	K/S	2	ad-lib	Mazuri
40	207	K/S	2	ad-lib	Mazuri
41	207	K/S	2	ad-lib	Mazuri
42	205	K/S	2	ad-lib	Mazuri
43	187	K/S	2	ad-lib	Mazuri
1 year	256	K/S	2	ad-lib	Mazuri

KEY: F - Krill Formula K - Whole Krill S - Sand Eels

*Ages estimate; based on initial weight and date of fledging

to transform into the dark black chin, nape and head. Along with these changes came the transformation of the mandibles from complete black with diminutive cream colour markings to the reddish-orange found in the adults. By 11 months there was, in the 22 birds, a marked deviation in the sub-adult plumage. At this age 30% of the Parakeet Auklets had developed plumage that included the above mentioned reddish-orange bill and black head, chin and nape. The remaining birds could be placed into two categories; 50% of the total colony developed partial adult patterns i.e. upper anterior portion of the mandible acquiring an orange colour and partial development of a dark head, chin and nape, while the remaining 20% retained the juvenile paradigm.

Wing span and length (point of mandible to termination of the tail) measurements were recorded on each bird at one year of age. The wing span of the auklets ranged from 45.7 cm to 50.8 cm with a mean of 48.6 cm. The length measurements ranged from 22.2. cm to 25.5 cm with a mean length of 26.0 cm.

Discussion

Parakeet Auklets were found to establish their nest-sites in less concentration than other auklets species on St. Lawrence Island. This dispersion, coupled with the inaccessibility of the cliffs or boulder rubble, emerge as one possibility for the lower mortality observed due to predation.

By emulating the nutrient-rich portions of their diet, zooplankton and fish, rearing of the Parakeet Auklet in a captive situation became possible. Artificial burrows provide a stable and secure environment for the chicks to develop and allowed for natural feeding behaviour until the time of fledging. Food consumption ranged from up to 45% of body mass per day at 8 to 15 days of age to 23% of body mass 2 to 3 days prior to fledging. This decrease in appetite probably coincides with a decrease in food offered by the adults at that time. A temperature range at or near 55°F was well suited for these birds once they left the protective accommodation within the brooders. By providing food items in the water the fledglings quickly recognised the objects from which to feed and were then self sufficient. Fledglings were ingesting greater amount of food at 30 days of age (28%) in comparison to body mass when compared to the days leading up to this event.

The morphological transformation of the Parakeet Auklet was tracked through the first year of maintaining the species at the Cincinnati Zoo. The development of the elongated feathers of the superciliary line from the eye to the ear along with the change in

eye colouration from bluish grey to pale yellow occurred at approximately ninety days of age. Sub-adult plumage was developed by eight months of age. 30% of the colony were represented by adult plumage consisting of black sooty head colouration, black chin and nape along with transformation of the mandibles from the black and cream colour pattern to the reddish-orange colour typified by the adults. 50% of the colony developed partial adult patterns exhibiting orange colouration on the top anterior portion of the mandible and development of an intermediate transformation to a slightly darker head, nape and chin. The remaining 20% showed no deviation in plumage pattern or mandible modification. Further study into the diverging variety of plumage demonstrated by first year birds is needed in order to understand the Parakeet's life history. By one year of age, the birds had developed full body mass and size, exhibiting a mean weight of 256 grams and dimensions of an average 48.6 cm wing span and 26.0 cm length from the point of the mandibles to the terminating point of the tail.

Behavioural patterns consistent with that of adult breeding birds were demonstrated in an immature manner during the first breeding season. Mutual feeding, defence of territory/cavities and increased aggression was all observed within the colony. Clearly Parakeet Auklets are not mature enough in the development to breed at one year of age.

By collecting juvenile birds, it has become possible to maintain the Parakeet Auklet in a captive situation. Information on hand-rearing, first year morphology and juvenile behaviour patterns have been documented, while further studies regarding feeding techniques and breeding are now possible.

LIST OF PRODUCTS MENTIONED

- Underpads: Sure Care, Regular underpads (17" x 23.5"), medical Disposable Division, 1165, Hayes Industrial Drive, Marietta, Georgia, 30062 USA.
- Vitamins: Mazuri, Mazuri Vita-Zu Bird Tablet 5m25, Purina Mills, Inc., P.O. Box 548, Richmond, Indiana 47375, USA.

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At this time we would also like to mention the vast amount of support and confidence that our Executive Director, Edward Maruska demonstrated towards the

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THE FALKLAND ISLANDS FLIGHTLESS STEAMER DUCK AT MARTIN MERE: A BRIEF HISTORY.

By P. J. Wisniewski and A. Wooldridge

The Falkland Islands Flightless Steamer Duck *Tachyeres brachypterus* is a large, sexually dimorphic coastal duck endemic to the Falkland Islands. The term "flightless" is a slight misnomer as they can fly low over the water but never attain any height. Wild birds breed from September to December usually in tussock grass or abandoned burrows. Outside the breeding season they may be found in pairs, family parties or larger flocks. They feed by upending or diving, usually at sea but occasionally in freshwater pools. They are extremely aggressive, especially the more massively built drakes. Captive breeding of this species has been achieved irregularly with few published records (Gewalt, 1968; Schmidt, 1969).

The Wildfowl and Wetlands Trust centre at Martin Mere near Burscough, Lancashire has had a long association with the Falkland Island Flightless Steamer Duck and the following account provides a brief history of the species in captivity at this centre.

The First Pair

During 1974 the first pair arrived at Martin Mere. These were captive-bred individuals originating from adults hatched from the wild collected eggs during the 1960's and maintained at the Wildfowl and Wetlands Trust at Slimbridge. These were housed in a pen measuring 15 x 5m and comprising 60% land and 40% water. The land area consisted mostly of grass with a small group of bushes close to the water. They were fed on a diet identical to that used at Slimbridge i.e. Beta dried dog food and trout pellets. The birds appeared to settle well but the female expired after seven months from visceral gout. The drake died after twelve months; an x-ray had revealed a metal staple in his gut and the bird did not recover from an operation to remove it. Post mortem revealed amyloidosis of the kidneys. The latter condition and the visceral gut observed in the female may have indicated too high a protein content in the diet. The swallowing of foreign bodies as observed in the drake is a common phenomenon and has been reported as a cause of death in other collections, presumably because these birds are used to swallowing hard objects i.e. shellfish, crustacea in the wild.

The Second Pair

During 1977 a second pair of Steamer Ducks arrived at Martin Mere, one being a Slimbridge-bred bird and the other from Wuppertal. Both were approximately two years old on arrival. These were housed in a lens shaped pen 26m long and 7.5m at its widest point with water at the front and a rocky area at the back sloping down to a pebbled area. Barrels were installed under rock caves to provide breeding sites similar to those used by eiders. This time the diet was altered to a mix of Beta dried dog food plus SDS Maintenance Pellet.

The drake was always very dominant and the first to come to food. He was also extremely aggressive with the female prior to the breeding season (in February and March in Britain) and the female had to be removed on several occasions to prevent damage. At the end of the breeding season (late March to April) the female could safely be put back with the drake as he no longer showed any interest in her. This lack of satisfactory pair bonding may have been a result of the birds being put together at too advanced an age (2 years old) and possibly to differences in rearing techniques for the two individuals. Later observations suggest that pairs need to be formed before birds reach one-year old for successful bonding.

In 1979 the drake was found drowned (at an approximate age of four years). Subsequent post-mortem revealed a catalogue of problems including aspergillosis (see also Schmidt, 1969), cyathostomiasis, Acuarria and atherosclerosis. The female died in 1980 (five years old) from enteritis.

The First Breeding

In autumn of 1982 two pairs of Steamer Ducks arrived from Slimbridge where they had been bred in the spring of that year.

The first pair ('A' & 'B') were put into the pen used by the previous pair from 1977 - 80. The second pair ('C' & 'D') were released onto the large South American Lake which measured 60m by 100m and also housed a flock of Chilean Flamingos *Phoenicopterus chilensis*, Muscovy Duck *Cairina moschata*, Red-billed Whistling Duck *Dendrocygna autumnalis*, Bahama Pintail *Anas bahamensis*, Chiloe Wigeon *A. sibilatrix*, Argentine Red Shoveler *A. platalea*, Rosybill *Netta peposaca*, Brazilian Teal *Amazonetta brasiliensis*, and Ringed Teal *Callonetta leucophrys*. A new pen was ready for the Steamers by April 1983 but during the intervening period they had killed about half a dozen birds, mostly Ringed Teal and Bahama Pintail. The new pen measured 16m by 24m and again consisted of a large pool with rocky backdrop and

FLIGHTLESS STEAMER DUCK

pebble shore. (Diet comprised SDS, Diet A.) The birds did not settle well in the new pen as it was adjacent to the large area that they once occupied and on several occasions one or both birds would leave the pen despite their "flightlessness"

The answer was to swap the two pairs around so that 'C' and 'D' were no longer adjacent to the South American Lake and this solved the problem.

In 1986 the female 'D' laid the first eggs. The birds had been provided with several potential nest sites and eventually nested in a plastic barrel covered with turf on an island. The first egg was laid on 4 April and a total of eight were produced. An egg was collected every other day while the female was away from the nest and each replaced with a wooden egg. The clutch was placed under a domestic goose but when candled after twelve days all proved to be clear. The dummy eggs were subsequently replaced by three European Eider *Somateria mollissima* eggs. Some aviculturists would disagree with this practice but we felt it to be important for first-time breeders to have something to rear in order to gain experience. We feel that this is particularly important for single pairs in side pens where they are not stimulated by the sight and sound of the other birds.

Experience has also shown that where eggs are taken from pairs of waterfowl year after year and allowed nothing to rear then they tend to cease laying. This female Steamer subsequently reared two young eider ducks.

The next egg was laid on 23 March 1987 again by female 'D' and the final egg of the clutch on 8 April. In total nine eggs were laid with periods of two to three days between eggs. All eggs were removed to the duckery where they were turned twice daily. No suitable foster parents were available so the first five eggs were placed in a moving air incubator shortly followed by the remaining four. After four days the eggs were candled revealing that the fifth egg to be laid was addled. The first four eggs were then placed under a broody hen. Of the remaining four eggs, the last to be laid was clear and the others were placed under a different broody hen. The first egg began to chip on day 29 and hatched on day 31. There was a gap of eight to nine hours between hatching in the first four eggs but the last three emerged together. Although initially placed in a brooder together, the last three to hatch had to be separated as the others showed aggression towards them even at one day old. The ducklings were very lively, pecking at each others feet and showed no hesitation in taking live crickets and mealworms in

addition to chickcrumb, chopped lettuce and chopped sand-eel.

No measurements were taken to avoid stress. As the species was known to be susceptible to aspergillosis and *Candida* the youngsters were treated with Ketoconazole. At an age of 22 days, one 12.5mg tablet was given to each bird every day for ten days and the dose was then increased to 25mg for a further ten days. Seven young steamers were successfully reared and weaned onto a diet of SDS Diet A, sprats and sand-eels and in the evening were seen to catch midges, moths and even the occasional House Sparrow *Passer domesticus* which came down to bathe. The youngsters were eventually moved to WWT Centres at Slimbridge (5) and Washington (1 pair).

After removal of their eggs the adult Steamer Ducks were given Aylesbury duck eggs to rear and subsequently hatched and reared four ducklings, making excellent parents. However the drake 'C' was suspected as having aspergillosis and was treated with Ketoconazole for twelve days after which the symptoms subsided.

Further Breeding

During 1988 the drake 'C' of the breeding pair appeared to be losing condition and as a result the two clutches of eggs produced by his mate, one of nine eggs and the second of seven, were both clear. In June of that year he was treated again with Ketoconazole for suspected aspergillosis and despite slight improvement his condition deteriorated later in the year and he was euthanised at the age of 15 years. Post mortem revealed that in addition to suffering from tapeworm and arthritis which probably would not have caused mortality, his oesophagus was blocked with grain.

The female 'D' was moved to a pen next to the non-breeding pair to prevent her from pining and to overcome territorial problems when a new drake was introduced i.e. if she was left in the breeding pen and a new drake introduced she might attack him causing stress or even preventing him from feeding.

In 1989 a new, three year old drake 'E' arrived from Wuppertal and settled in well with his new mate 'D'. Prior to that the female had laid another two clutches of clear eggs. However, the "non-breeding" pair 'A' and 'B' laid six eggs of which two hatched. The youngsters, a pair, were reared successfully though the female was treated for vitamin E deficiency. Both later went to Slimbridge. Sadly, the female 'B' then died (in November aged eight years) and post mortem showed necrotic dermatitis of the foot (bumblefoot), a massive burden of tapeworms, (despite routine treatment with Panacur), nephropathy and TB. A female 'F' from Martin Mere's

first clutch then arrived from Washington to join the male 'A' who then promptly died during December from aspergillosis, also at eight years of age.

In 1990 both females 'D' and 'F' laid clutches of clear eggs and in 1991 the pair 'E' and 'D' produced a clutch of 10 eggs all infertile. The drake 'E' died of DVE at five years of age, leaving two potential laying females. They were housed together in the absence of mates and although they did not at first associate, despite being mother and daughter, they eventually became inseparable.

In 1992 'D' laid nine eggs in a barrel. These were replaced with chipping mallard eggs which she reared successfully. The other female showed no aggression towards the young but neither did she show any interest. In 1993 'D' again laid an infertile clutch of seven eggs. These were replaced with Mallard eggs and both females bonded with the clutch. In 1994 both females produced clutches but the older female 'D' died of chronic peritonitis in November aged 13 years. Sadly the remaining nine year old female was lost in January 1995 due to fox predation.

No attempt was made to pair the two females after 1990 due to the unavailability of reliably pure-bred drakes.

ACKNOWLEDGEMENTS

Mortality data was supplied by Charlie Liggett and post mortems carried out by Dr John Baker at the Veterinary School, University of Liverpool. Christine Harrison typed the manuscript.

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* * *

CAPTIVE MANAGEMENT AND BREEDING OF BALI STARLINGS AT JURONG BIRDPARK, SINGAPORE

By Khaja Nazimuddeen, Senior Research Assistant,
Jurong BirdPark, Singapore.

The Bali Starling *Leucopsar rothschildi* is the most beautiful starling in the world. Evidently found on the northwestern peninsula in Indonesia, this wonderful bird, sought so desperately by many, is in danger of becoming extinct in the wild. The last count of these birds put them at 35 - 37 circa surviving in the wild. (Van Balen 1993). The Bali Starlings' precarious state of danger seems to have come mainly from taking of birds from the wild, for keeping as pets and for display at zoological collections around the world. Even reintroduced birds are stolen from the Bali Barat National Park.

The bird is not a closed forest species. It prefers woodland and tree savanna, particularly when interspread with forested valleys. (Hughes and Turner, 1975). The species seems to be insectivorous, but also forages for fruits, particularly during the dry season, when insects are scarce. Bali Starlings are known to raise their young purely on insectivorous food (Hughes and Turner, 1975). They breed in tree holes loosely lined with dry grass, twigs and an occasional feather. Normally three blue green eggs are laid, of which two are hatched and one young survives. They probably produce only one brood per year due to the limited breeding season. (Hughes and Turner, 1975).

Housing and nesting facilities

The breeding pairs of Bali Starlings at Jurong BirdPark occupy aviaries located at the Park's off-exhibit Breeding Centre. All the breeding aviaries are of similar dimensions. They each measure 2.35m x 2.35m x 2.25m high. There are two compartments to each of our breeding aviaries to provide maximum space. One compartment serves as the feeding area while the other compartment is utilized for the nestbox. All the aviaries have concrete flooring. Potted plants are placed in the aviary for greenery and as cover for the birds. The compartment with the feed bowls is only opened to feed the birds. We also place a basin of water for the birds to bathe. It must be mentioned that the Bali Starlings love taking baths daily even when incubating eggs or raising chicks. Bali Starling fledglings have been seen taking baths very early upon leaving their nest.

Nest boxes measuring 10" x 10" x 15" high with an entrance hole of 5" is installed at a height of 2m. Each nestbox has an inspection door at the side to monitor the eggs and the chicks and to change nesting materials when required. (Fig 1) Nesting materials provided for the birds consist of leaves and twigs from *Acacia auriculiformis*, dry grass and shredded papers as added substrate especially so when there are chicks in the nest. It has been observed that pairs tend to move their chicks to corners of the nestbox where there is insufficient nesting material. Chicks have been found on the nestbox floor without proper support for their legs. This has resulted in some having splayed or spraddled legs.

When pairs are raising young it is important to inspect the nest at least once daily to monitor the development of the chick. We inspect our chicks twice a day, once in the morning and in the evening. Our breeding pairs have become accustomed to this checking of the nest boxes and are not disturbed.

Diet

At Jurong BirdPark, the birds are given a diet consisting of live food and a low iron softbill pellet. They are fed twice a day.

Our morning diet consists of butter cake, boiled egg, a local softbill pellet, ant eggs and mealworms. The cake and egg are grated and kept in a refrigerator. Ant eggs, mealworms and the pellets are mixed to the prepared food every morning just before each feeding. Each pair is fed about 120 grams of food in the morning.

At midday the food is changed. Our afternoon diet consists of the softbill pellets, pieces of papaya, banana and apple. We do not give live food in the afternoon to our birds. Crickets, grasshoppers and earthworms are alternated with mealworms in the morning diet as a source of live food.

For pairs with young, we have a different feeding procedure. From day 0 to 3 we give the breeding pair every hour from 8.00 am to 6.00 pm 7 to 8 white mealworms. We give only white mealworms and pupae because of the high level of keratin in brown mealworms. Earlier chicks have died of stomach impaction as necropsy done on our young chicks show stomach impaction with undigested cuticles of brown mealworms.

If a pair has 2 or 3 chicks, we give as much as 10 white mealworms. From day 4 to 10 we start giving other forms of live food like earthworms, grasshoppers; small crickets and occasionally day old mice. At this age we feed them at intervals of 1 1/1/2 to 2 hours. Live food before being given to the birds is sprinkled

with calcium. It has been observed that when raising chicks, adult birds would beat the live food on the ground, thus mashing it up before

Pair selection

Bali Starlings are sexually dimorphic in that the backward directed crest is longer in the male, and in mature adult males several long plumes trailing over the shoulders are seen quite clearly. (Hughes and Turner, 1975). But at the Park, we confirm the sexes through endoscopy as we have found the sexual dimorphism to be variable.

Females at our Park have laid eggs at 14 months. But males are known only to reach maturity at 2 years of age. A strong pair bond is an important factor for successful breeding. At the Park, we let the birds form their own pairs.

All our unpaired female birds are placed in a holding aviary. The holding aviary has an adjoining compartment where we place a male bird. The male bird will be able to see all the females placed in the holding aviary. All our birds are colour ringed. After placing the male bird we observe for a week or more which female spends most time interacting with the male. We make our observations based on display between the male and female, bobbing, allopreening and vocalisations. Once a pair is confirmed, they are removed to a breeding aviary.

Feather plucking

Feather plucking was found to occur mostly in a crowded cage containing unpaired birds. Feathers of the throat-neck and crest were affected. This behaviour is related to allopreening.

Breeding performance

Table 1 shows that for the five years analysed, 40% of the total eggs laid either go missing or end up broken. Bali Starlings are suspected of breaking infertile eggs.

Infertility seems to be a problem. From the data gathered for the five years, we see that 33% of the total eggs laid are infertile. If the missing and broken eggs are accounted as infertile then the percentage of infertility will be 73%.

Infertility of eggs can be because of parental age, inbreeding, non-synchronous breeding conditions and lack of pair bond. The Bali Starlings at JBP have been acquired locally or were given to the Park by authorities who confiscated them and as such, important data like the age of the bird, its sire, its dam, its past history are absent. These data are very important for planning the breeding of the starlings.

Table 1 also shows that only 38% of the fertile eggs hatch. 16% of total eggs laid are either embryonic death or dead-in-shell. Reasons for embryonic death and dead-in-shell could be from incompatibility of breeding pairs, viral infection - parent to egg, parent nutrient deficiency and the age of the parent birds and abnormal sperms.

We can also see that breeding pairs are able to raise young quite successfully, 62% of the hatchlings survive. It seems that the problem in general is one of low fertility rather than one of raising young successfully.

Table 1 Breeding Data 1989 to 1993

Year	Females	No. of Clutch	E/L	M/B	INF	E/D	HAT	R/S	%F	%R
1989	3	7	21	7	9	1	4	2	24	50
1990	2	5	17	14	3	0	0	0	0	0
1991	5	14	42	19	13	6	4	2	24	50
1992	5	24	72	28	25	15	4	4	26	100
1993	4	18	54	15	19	11	9	5	37	55
Total		68	206	83	69	33	21	13	26	61

Table 2 Breeding Data by Months 1989 to 1993

Month	E/L	M/B	INF	E/D	HAT	R/S	%F	%R
January	15	7	1	6	1	1	46	100
February	9	4	4	1	0	0	11	0
March	17	7	5	2	3	2	29	66
April	6	4	0	2	0	0	0	0
May	13	8	1	3	1	0	30	0
June	11	4	3	4	0	0	36	0
July	15	12	1	1	1	0	13	0
August	9	3	6	0	0	0	0	0
September	26	14	8	1	3	2	15	66
October	25	5	16	3	1	1	16	100
November	33	11	11	6	5	3	33	33
December	27	4	13	4	5	4	37	66

Keys:

Females - Females breeding per year. *No. of Clutches*- No. of clutches per year.
E/L- Total Eggs laid per year. *M/B* - Eggs missing or broken. *INF* - Eggs infertile
E/D - Eggs with embryonic death or dead-in-shell. *HAT* - Eggs that hatch
R/S - Chicks that are reared and survived. *%F* - Percentage fertile of total eggs laid.
%R - Percentage reared of eggs that hatch.

Table 2 gives the breeding performance of the birds during the different months of the year. As can be seen, the pairs breed throughout the year at Jurong BirdPark. It is during the third quarter (October to December) of the year that most eggs are produced.

This is not surprising as it is also the time of the year when rain is abundant. As the breeding season in the wild coincides with the rainy season the abundant availability of insects late in the wet season, when young are hatched plays a role.

Incubation of eggs and care of young

Bali Starling eggs hatch after about 14 days incubation. Most pairs start incubating after the clutch of three eggs are laid. Both the male and female have been observed incubating but the female incubates most of the time.

It has been observed that Bali Starlings like other species of mynas e.g. Common Myna *Acridotheres tristis* constantly keep adding and removing nest materials during the breeding cycle. The chick when hatched is fed by both parents. The female usually plays a major role for the first few days but when there is more than one chick, or if a chick is more than six days old, both parents have been observed feeding their offspring.

At the Jurong BirdPark we always want the parent starlings to raise their young. But in some cases we had to pull chicks out mainly because parents stop feeding or the chicks suffer some injury.

In such cases the chicks are handraised at the Park's nursery. The table below is a summary of one such chick that was raised.

Most chicks bred at the Jurong BirdPark fledged at about 18 days varying between 17 to 20 days in some cases. The most important thing to note during hand-rearing of such a rare species is the effect of imprinting. We always try to minimise it as much as possible by having as little contact with humans as possible and by introducing new fledglings to their own kind as soon as possible.

Conclusion

Zoos are fortunate in having an endangered species like the Bali Starling in sufficient numbers in captivity to sustain a good breeding programme. As such, we need to determine the causes of observed variations in breeding performance to ensure further successes.

Nevertheless, the success of the captive breeding of the Bali Starling has improved since the programme's inception. Exchange of information between zoos breeding Bali Starling is required to

solve some 'minor hiccups' on an otherwise successful programme. I am confident that with those problems solved, we can all be proud to have saved yet another species from the verge of extinction.

Development Chart of Bali Starling

Age (days)	Wt (g.)	Development
1	7	Large white yellow beak; white down; eyes closed; placed in container with newspaper shredding as substrate. Temp between 32 - 35° C, feeding 1 - ½ hours.
3	8	Started on soaked softbill pellet and papaya.
5	18	Calcium; other vitamins added to diet.
6	19	Feather tracts appearing; pins on wings visible
8	36	Pins more visible over wings and bodies; eyes fully opened.
11	57	Feathers have started erupting from pin shafts and on feather tracts.
12	64	Aware of people moving. Brooder temp 29-30 C
13	67	To cage with shredded paper lining and low perch.
14	74	Feathers erupting on wings; body totally covered; forehead feathers erupting
15	78	Moving around. Feeding every two hours.
16	80	Less interest in food, fledgling, able to jump and walk.
18	83	Able to perch well, more interest in live food.
21	83	Flapping wing vigorously, fully fledged.
23	82	Pecking instinct visible; to larger cage totally concealed.
25	76	First flight. Food provided - papaya.
33		Able to eat mealworms.
35		Food consumed overnight.
38		Weaned off and moved to holding aviary.

Conclusion

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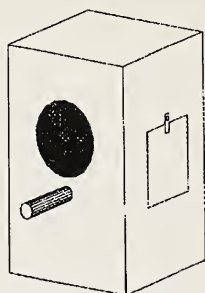


Fig. 1

Bali Starling Nesting Box 10" x 10" x 15"

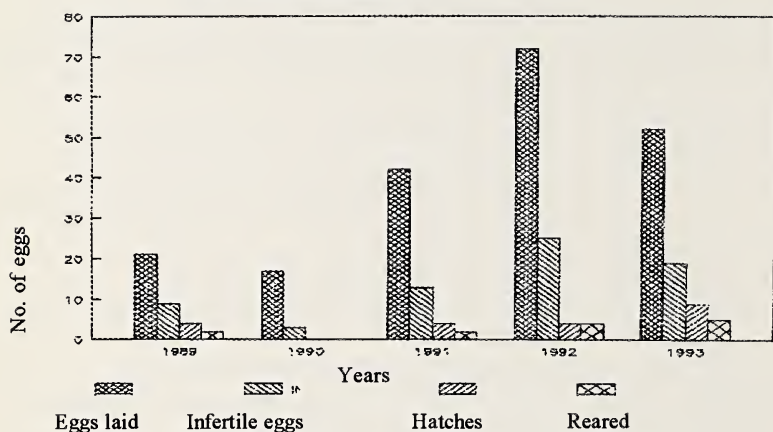


Fig. 2. Breeding for 1989 to 1993

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Typical juvenile plumage at six months of age



Cincinnati Zoo & Botanical Gardens

Sub-adult plumage demonstrating near adult plumage

Parakeet Auklet



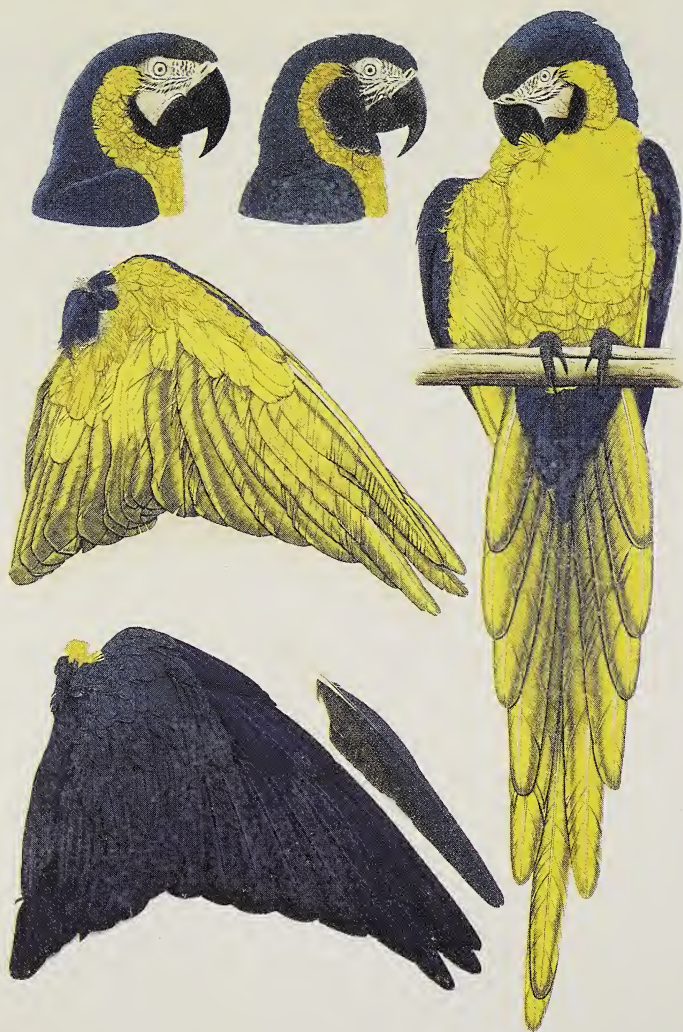
Joe Blossom/WWT

Adult pair of Falkland Islands Flightless Steamer Duck at W&WT Centre Martin Mere



Wildfowl & Wetlands Trust

Juvenile Falkland Islands Flightless Steamer Duck



Elizabeth Butterworth

Blue and Gold Macaw (see text page 41)

BREEDING THE GREATER NILTAVA

By Martin Vince. Sedgwick County Zoo, Wichita.

Muscicapidae is the family of Old World flycatchers comprising a dozen or so genera, one of which is *Niltava*. Exactly how many *Niltavas* make up the genus depends on which literature is consulted, although the long-established and traditional view is that it contains six members: Greater *Niltava grandis*, Lesser *N. macgregoriae*, Fukien *N. davidi*, Rufous-bellied *N. sundara*, Sumatran *N. sumatrana* and Vivid *N. vivida*. Some authorities, however, have greatly enlarged the *Niltava* genus: one of the genera that makes up Muscicapidae is *Cyornis*, but in the checklist given by Howard and Moore this genus is eliminated and all of its members converted to *Niltavas*. Similar treatment is also given to several *Ficedula* and *Muscicapa* species, swelling the *Niltava* genus to a grand total of 24 and transforming such familiar names as the Tickell's Flycatcher into Tickell's *Niltava*. Flycatcher taxonomy has always been in a state of flux. Presently I can find 4 different scientific names for the Indian Verditer Flycatcher but generally such work is academic since for the aviculturist the members of this wonderful family share broadly the same requirements. In appearance the Greater *Niltava* is more like a thrush than a flycatcher being a fairly large, roundish bird measuring about 21cm. There is no mistaking the sexes. Although in poor light the male appears as almost black; when properly illuminated he is dazzling. Only his face, throat and breast are actually black with a sparkling cobalt blue covering the crown, nape, lesser wing coverts upper tail coverts and forming a bar on either side of the neck which, in a paler blue, is shared by the female. His wings and tail are a dirty purplish-blue, the back a slightly cleaner shade and the underparts greyish blue. The female is an all-over pleasant brown highlighted by the shiny, light blue bar on either side of her neck. Her wings and tail are reddish brown, the vent area grey and throat very pale brown.

Niltava grandis is certainly rare in aviculture although in the wild all four recognised sub-species are said to be at least common in their respective ranges: *N.g.grandis* (E.Himalayas to N.Vietnam), *N. g. decipiens* (Sumatra, S.Thailand, Malaysia), *N.g.griseiventris* (S.E.Yunnan) and *N.g.decorata* (S.E.Vietnam). It is a fairly robust bird and a resident of the humid evergreen forests at elevations

between 1,000m and 2,500m, descending to the warmer foothills in regions where winter forces it. Various habitats are occupied from the deepest parts of the forest to clearings and along trails. It will swoop to the floor for an insect or catch slow flying insects on the wing. Even in the aviary its manoeuvrability is such that a moth can be caught after only a short aerial chase.

Accommodation

Towards the end of 1992 the zoo purchased a pair of Greater Niltavas, housing them off-exhibit in an aviary measuring 3m x 1m x 2m high. Of the 10 or so Niltava pairs I have kept (Lesser, Rufous-bellied and Greater) none of them have needed to be parted due to fighting, although certainly many insectivores are prone to such aggression, and to house the male and female alongside each other for an introductory period is prudent. Having completed the zoo's standard 30 day quarantine, the Niltavas had, in fact, been so housed and were used to the sight of each other. Without apprehension they were therefore released into their aviary, of which they were the sole occupants.

The aviary is furnished with perches of varying diameters, a 1m high Rubber Plant and five hanging baskets of bushy, fast growing species; the baskets hang from the aviary's roof while the plant is on the floor, towards the front of the aviary. The birds are not especially nervous, but such foliage can only encourage breeding and generally speaking the more the better. And to increase the feeling of seclusion, coconut matting lines the aviary's walls, which also visually separate the Niltavas from their neighbours. The aviary floor is covered with coarse sand, a few log pieces and some small potted plants.

It is one of a number that are collectively maintained at about 24°C with about 60% humidity provided by a mister system. This is programmed to operate for five minutes every afternoon, being beneficial for the plants as well as encouraging reluctant bathers to clean their plumage.

Diet

In the wild Greater Niltavas are said to eat berries during the winter to supplement an otherwise insectivorous diet. Given the choice, however, berries and fruits in general are not at all popular and in captivity a good quality, fine-grade insectile mixture will completely meet a Niltava's nutritional requirements. Some 10% of the insectile mix should contain livefood such as mealworms, wax moth larvae and medium sized crickets. And if not already moist, the mixture should be softened with milk, pureed apple or

tofu. As for all insectivores, I add finely chopped or mashed hard boiled egg since it is an often popular food, coming a close second to the insects themselves. It presumably resembles ant pupae or a similar food eaten in the wild (see also Vince 1994).

Breeding

Niltavas build a cup shaped nest either in vegetation or concealed in cavities, such as may be found in rockwork or rotten tree stumps. The Niltavas were therefore offered a half open-fronted nest box measuring 15cm x 15cm x 23cm high. It was empty and fixed high up at the back of the aviary so as to almost touch the roof. In the middle of February both birds became more vocal than usual. Even at its loudest the Greater Niltava is a quiet bird but now the soft, ascending three or four note whistle could be heard often, sometimes repeatedly for 30 seconds or more. The pair was rather shy, but luckily I did see the female try to attract the male to her: with her body lowered about 2cm she stood on a high perch and fluttered her wings, but he was not enticed and her amour appeared to die there. Three weeks later, however, on March 6th, nest building began and lasted for eight days. The nest was constructed in the box provided and was a full 7cm deep when complete. It comprised pieces of fine string, leaf fragments, fine grasses and Sphagnum moss. By far the major ingredient though was bison wool collected from the zoo's North American exhibit; lambs' wool was also offered but little was accepted. As far as I could tell the female alone built the nest and, very interestingly, *did* appear to discriminate between the wools. She selected almost exclusively those of a dark shade, ignoring the paler colours, especially white, irrespective of whether they were lamb or bison in origin. Much of the lambs' wool was in fact white and I am sure that explains its lack of appeal, since as a nesting material most other birds find it to their liking. Although I have had little experience of birds selecting materials according to their shade, the pale fibres may have been rejected because they were considered too conspicuous. The nest was completed on March 14th and the first of three eggs was laid on the 15th. Incubation was carried out solely by the female and began with the laying of the first egg. The eggs were an ivory colour but very heavily marked with rust coloured speckles of varying sizes. Three weeks passed and nothing had come of the clutch; the eggs were found to be clear and were duly removed. Twelve days later three more eggs were laid but they too were clear. Fourteen days after their removal another clutch of three was laid. This time all were fertile and three chicks hatched, one day apart,

following 14 days of incubation.

Plenty of wax moth larvae, mealworms and medium sized crickets were offered as a rearing food to supplement the standard insectile diet as well as maggots and hatching blowflies. The latter had proved very successful in the rearing of Verditer Flycatchers although were completely ignored by the Niltavas. Care was taken to dust the livefood with a vitamin and mineral powder since the most risk of rickets in insectivores' chicks is higher than with most other softbills: omnivores feed their chicks purely livefood only for the first week or so, thereafter feeding the more varied adult diet. But insectivores such as Niltavas receive purely livefood for about the first month, until they are old enough to feed themselves and therefore follow their parents' example in eating the insectile mixture. Experience has shown that 1 week is not long enough to give rise to rickets although 1 month almost certainly is.

Hand Rearing

I only ever observed the female taking food to the nest with the male standing guard; I do not think he was specifically guarding her but his nervousness at one's approach alerted her, nevertheless. As with many birds the wax moth larvae was the favoured rearing food but for reasons I have never been able to fathom, the female also fed tiny pebbles to her young, a fact not apparent until two chicks were thrown dead from the nest nine days after hatching. Though looking very much alive and with prospects, the third chick seemed doomed in the care of its mother. It was therefore removed for hand rearing at 10 days of age. The chick weighed 27.3g and was initially brooded at 90°F although this was reduced to 80°F two hours later, in response to the bird's mild panting. The chick was taken from the nest on June 14th at 9am. At 10.30 six tiny pebbles, 2mm in diameter, were found beside the bird and since they were not in the faeces were presumably coughed up. From there onwards it was plain sailing, especially since the chick was fully feathered, reasonably large and, had it remained with its parents, only three or four days from fledging. Chopped pinks, wax moth larvae and mealworms were the rearing foods being dipped in pureed green beans (as sold for newborn babies) before feeding. Included also was a sprinkling of a vitamin and mineral supplement to guarantee the diet's quality. On June 14th a total of six chopped pinks plus eight moth larvae and mealworms were eaten, spread more or less evenly over eight feeds from 9.00am to 9.00pm. The following day the Niltava was perching on the side of its margarine tub. Its appetite had dropped slightly but on the 16th, rose to consume 10

pinks plus five larvae and worms. On the 17th, flying skills were discovered as the chick almost flew out of the brooder. And on the 21st it started to feed itself, eating a couple of slices of pink. From the 21st to the 30th, the chick was fed four times a day. By hand (using tweezers) it was now only being fed five to six pinks a day with the remainder of its diet taken by itself from a food dish. The dish contained the standard insectile diet but with chopped pinks on the surface. Although the pinks would not feature in the adult diet, they were still of value; in eating them the bird would be introduced to the insectile mix as it stuck to their wet surfaces. Hand feeding was gradually reduced until on July 13th it was stopped completely. The bird was now 5½ weeks old and placed in its own indoor aviary that was maintained at about 70°F. By now the chopped pinks had been removed from the diet and the young Niltava was thriving on the standard adult insectile mixture.

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CHESTER ZOO BIRD REVIEW 1994

By Roger Wilkinson, Curator of Birds.

With the advent of Ostrich farming and resultant scarcity in zoos of female Ostriches our male Masai Ostrich *Struthio camelus massaicus* remained unpaired in 1994. We have now been promised a 1994 bred female on breeding loan but it will be several years before we may expect egg-laying. The Emus *Dromaius novaehollandiae* hatched a single chick in March and began laying again in December. Rheas *Rhea americana* were also successful in rearing chicks this year.

Whereas only two Humboldt Penguin *Spheniscus humboldti* chicks hatched in 1993 (neither of which survived) 10 were hatched between March and July. Again we experienced problems with these chicks but by the year-end three fine youngsters had been reared. Five more chicks hatched in December and we hope this may be a turning point, returning us to those heady years of 1986-1988 when 46 chicks were reared over a three year period. With managed breeding programmes, any one zoo producing such high numbers is now less important and indeed may be contrary to the aims of the programme. Over the whole of Europe the co-ordinated Humboldt Penguin population continues to increase even though individual colonies have their ups and downs. Six unrelated young Humboldts were received on loan at Chester from Penscynor and a further six purchased from Birdworld.

Other new arrivals include two White Pelicans *Pelecanus onocratulus* bred at Tierpark Berlin. It is over 15 years since Chester Zoo last held pelicans so these new additions have caused some excitement here. Also new to the collection are four Scarlet Ibis *Eudocimus ruber* received from Zurich Zoo. Six Waldrapp Ibis *Geronticus eremita* were successfully parent-reared by two pairs in the original colony. Those Waldrapps transferred to the 'Europe on the Edge' exhibit showed little interest in breeding in 1994. At the year end a group of 1993 bred birds were transferred to the new exhibit and with this increase in numbers it is hoped the resident Waldrapps may be stimulated to breed this year.

Six Chilean Flamingos *Phoenicopterus chilensis* were reared in 1994. The increase in the numbers of Chilean Flamingos reared this year resulted from intensive egg management. Each egg was removed and replaced by a wooden dummy. If fertile the egg was

returned a few days prior to pipping and left to hatch under the parents. This allowed a greater number of eggs to hatch and more chicks to be reared. Observations indicated that there was much aggression between flamingos in the closely adjacent nests with eggs being deliberately knocked off nests. Indeed the only way to ensure the birds remained sitting on nests once their own egg had been removed was to use a spiked dummy egg that could be firmly secured into the nest. Unsecured dummies were knocked off and the nests taken over by other pairs. The first egg returned to a Chilean nest had just externally pipped. This proved to be a mistake for it was immediately knocked off the nest by a non-parental female. On being returned to the nest again that same female rushed to the nest before the parents could return and deliberately smashed the egg with her bill. She had been looking for a preferred central nest site herself as indicated by her laying an egg the next morning. Subsequently eggs were returned before external pipping and all six hatched and were reared.

Egg management was practiced only for the Chilean Flamingos where a problem had been indicated after only a single youngster was reared in 1993. The Caribbean Flamingos *P. ruber ruber* also reared six chicks but without our intervention.

Four Black-necked Swans, *Cygnus melanocoryphus*, five Red-breasted Geese *Branta ruficollis* and four Hawaiian Geese *B. sandvicensis* were reared - the latter by their parents. Other waterfowl reared include Mandarin Ducks *Aix galericulata*, Carolina Wood Ducks *A. sponsa*, Laysan Teal *Anas laysanensis*, Marbled Teal *Marmaronetta angustirostris*, White-winged Wood Ducks *Cairina scutulata*, Rosy-billed Pochard *Netta rufina*, Hooded Mergansers *Mergus cucullatus* and Smew *M. albellus*. Three Smew were hatched and reared under their mother, the ducklings being transferred with their mother to a shed once hatched. Cuban Whistling Ducks *Dendrocygna arborea*, recently received on loan from the Wildfowl Trust, Slimbridge, laid during the year but none were hatched. White-headed Ducks *Oxyura leucocephala* and Baikal Teal *Anas formosa* were hatched but neither were reared to independence.

Five Bare-faced Curassows *Crax fasciolata* were reared as were 10 Temminck's Tragopans *Tragopan temmincki* and two Satyr Tragopans *T. satyra*. Both the Temminck's and Satyrs were allowed to sit later clutches and both proved to be excellent parents. We were especially pleased to receive a pair of Blyth's Tragopans *T. blythii* on loan from the World Pheasant Association. These were

bred by Glen Howe in Canada and quarantined on our behalf by Banham Zoo. Other galliforms bred in 1994 were 15 Edwards' Pheasants *Lophura edwardsi* 15 Himalayan Monals *Lophura impeyanus*, Golden Pheasants *Chrysolophus pictus*, Palawan Peacock-Pheasant *Polyplectron emphanum*, Common Peafowl *Pavo cristatus* and Californian Quail *Lophortyx californica*.

Our Red-crowned Cranes *Grus japonensis* reared two youngsters. This was the first time they had hatched two chicks and the siblings at first fought viciously causing us much anxiety. However after several weeks this aggression faded and both chicks were reared together. For the first time we attempted artificial insemination on our Wattled Cranes *Bugeranus caruncu/atus* and Demoiselle Cranes *Anthropoides virgo*. Debbie Bourne was kind enough to demonstrate this for our Wattled Cranes and the procedure was repeated by our staff on the Demoiselles. Sadly the exercise was unsuccessful in that the Wattled Crane eggs proved infertile and the Demoiselles failed to recycle. Blue Cranes *A. paradisea* are new to the collection having been received on loan from Harewood Bird Gardens and from Whipnade Zoo.

Gough Island Moorhens *Gallinula comeri*, after a number of years with unsuccessful breeding attempts, succeeded in rearing a chick from their first brood this year but were unsuccessful in rearing two chicks hatched from a later brood. Our two male Sun Bitterns *Eurypyga helias* have been without a mate for over ten years. As such we were extremely pleased to receive a female on loan from Birdland, Bourton-on-the-Water. She also is quite an elderly bird so it will be interesting to see whether we can achieve a pairing.

A group of Avocets *Recurvirostra avosetta* now grace the 'Europe on the Edge' aviary along with Stone Curlews *Burhinus oedicephalus*. Also new to this enclosure are four wild type Rock Doves *Columba livia* donated by Zurich Zoo. Within Great Britain there are now few pure colonies of Rock Doves, most having been infiltrated either by feral pigeons or stray racing pigeons.

Nicobar Pigeons were received only recently into the collection and are housed as a group in the first block of new spacious aviaries in the Tropical House: one pair nested and successfully reared a chick. A pair of Rothschild's Mynahs *Leucopsar rothschildi*, sharing the same enclosure had five successive breeding attempts from which a total of 16 chicks were hatched. Eight of these were reared by a combination of parent and hand-rearing. Three other pairs of Rothschild's Mynahs held elsewhere in the collection

failed to hatch a single chick between them. Both pairs of Superb Fruit Doves *Ptilinopus superba* reared chicks but the three reared to maturity all moulted out as males. Blue Crowned Pigeons *Goura cristata* after being moved down into one of the new Tropical House aviaries laid for the first time since they were received in the collection. Pink Pigeons *Nesoenas mayeri* released into the free-flight of the Tropical House failed to nest but have become aggressive towards other pigeons in the same area although not to other birds. If the Pink Pigeons would breed in that area then as an endangered species such disturbance would be acceptable. Should no breeding attempts ensue then we may have to re-think this option and house them elsewhere.

Softbills successfully reared in 1994 include Trumpeter Hornbills *Bycanistes buccinator*, African Grey Hornbills *Tockus nasutus epirhinus*, Schalow's Touracos *Tauraco schalowi*, Kookaburras *Dacelo novaeguineae*, Red-billed Blue Pies *Urocissa erythrorhyncha*, Azure-winged Magpie *Cyanopica cyana*, Pekin Robins *Leiothrix lutea*, Red-tailed Laughing Thrush *Garrulax milnei*, Superb Spree Starling *Spreo superbus* and Asian Red-eyed Starlings *Aplonis panayensis*.

Tawny Frogmouths *Podargus strigoides* were bred for the first time at Chester, one chick being hand-reared from an incubator hatched egg.

The Wrinkled Hornbills *Aceros corrugatus* made no breeding attempt when in the Bird House during the summer and were moved in the autumn to their new quarters in the Tropical House. Our original pair of Channel-billed Toucans *Ramphastos vitellinus*, despite the female now looking her age, again fledged two chicks. These youngsters looked excellent strong birds so I was the more surprised on returning from a zoo visit to California to discover that both youngsters and the breeding male had died during my absence. That sadly may have signalled the end to eight years successful breeding of Channel-billed Toucans. Our second pair also succumbed during the final month of the year. Post mortems have suggested differing causes for each death but I cannot help but feel there must have been some unidentified common condition that led to these five deaths in such a short space of time.

Success is not easily won with birds and where no co-ordinated breeding programmes exist we are now forced to question the long-term value of aviculture. Fortunately, many such programmes exist for many parrots allowing the possibility of recovery from the intermittent setbacks in individual collections.

Our parrot breeding results exceeded our expectations this year but we were brought back to earth at the end of the year with the deaths of several important birds. Both pairs of Blue and Gold Macaws *Ara ararauna* fledged two youngsters. However one of these pairs have developed a habit of plucking their chicks in the nest. Surprisingly this is the pair held in the largest enclosure whilst the pair maintained in the smaller parrot house aviary have never displayed this vice. The Red-fronted Macaws *A. rubrogenys* hatched and reared five chicks in one brood. Five Blue-eyed Cockatoos *Cacatua ophthalmica* were hand-reared from incubator hatched eggs. Again the main breeding pair of Blue-eyed Cockatoos were allowed to sit a clutch of their own eggs but this was without success. Green-cheeked Amazons *Amazona viridigenalis* hatched and reared four chicks and the Lilacine Amazons *A. autumnalis lilacina* reared two chicks. Again this was soured by the loss of the breeding female later in the year. Our Cuban Amazons *A. leucocephala* were obtained as confiscated birds from Customs and Excise. These form part of a breeding programme in U.K zoos managed from Chester. We were extremely pleased when the Cubans nested but perhaps due to her partner's inattentiveness, the female abandoned her three chicks after two weeks necessitating them to be taken for hand-rearing. All three were successfully reared completing our hat-trick of Amazon breeding in 1994. Yellow-backed Chattering Lories *Lorius garrullus flavopalliatu*s and Stella's Lorikeets *Charmosyna papou goliathina* were successfully reared. Only one Musschenbroek's Lorikeet *Neopsittacus musschenbroeki* fledged but unfortunately did not survive to the year end.

Other parrots bred included two Derbyan Parrakeets *Psittacula derbyana*, four Splendid Parrakeets *Neophema splendida*, four Slender-billed Conures *Enicognathus leptorhynchus*, four Greater Vasa Parrots *Coracopsis vasa* and two Lesser Vasa Parrots *C. nigra*.

This year's greatest success was in the hatching of two Thick-billed Parrots *Rhynchopsitta pachyrhyncha* both of which were parent-reared. Golden Conures *Guaruba guarouba* after laying for the first time in 1993 went one stage further by hatching but failing to rear a chick in 1994.

New arrivals included Black-winged Lories *Eos cynaogenia* and Blue-streaked Lories *E. reticulata* on loan from Penscynor and amongst other birds a pair of exquisite Red-flanked Lorikeets *Charmosyna pulchella* generously donated by Frank Woolham.

The Snowy Owls *Nyctea scandiaca* were unsuccessful in rearing their chicks but three White-faced Scops Owls *Otus leucotis* and four Barn Owls *Tyto alba* were reared. We work in close conjunction with the Keele University Barn Owl Release Scheme run by Dr Carole Hackney and as in previous years the young Barn Owls were donated to the release scheme. A total of 111 Barn Owls bred at Chester Zoo have now been released through this and other approved schemes in Cheshire, the Wirral and more recently Staffordshire. With the increasing pressures on wild bird populations zoos like Chester are looking at how they can become further involved in zoo breeding programmes that are linked to conservation in the wild.

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BOOK REVIEWS

A recent publication from the Wildfowl & Wetlands Trust, *Wetland, Industry and Wildlife* by Antony Merritt is a valuable book, not only for the growing number of wildlife officers and ecologists now working in UK industry, but for anyone with land which includes an area of one of the world's most threatened habitats.

It is above all a practical guide to the creation, restoration and maintenance of wetlands so that they are of real value to wildlife. The book has 182 pages and although colour photographs are used only on the front and back covers, it is generously illustrated throughout with photographs and plans.

The manual is set out in three parts which describe and discuss a range of topics related to wetlands, industry and wildlife. Part I considers the role and involvement of industry in the creation and management of wetlands. Part II provides an overview of wetland ecology, design, creation and management, drawn from recent literature and experience. Part III looks at the most significant types of industrial wetlands found in the UK, featuring selected case studies where appropriate, and considers their current and potential value to wildlife.

There are also 11 useful appendices dealing with associated subjects including trees and shrubs; aquatic plants; birds of freshwater and estuarine habitat; etc.

Wetlands, Industry and Wildlife by Antony Merritt, costs £14.95, inclusive of postage and packing. Published by the Wildfowl & Wetlands Trust, Slimbridge, Gloucester, GL2 7BT (tel: 01453 890333) from whom it is available.

F.W.

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Without actually seeing and handling it, and leafing through its 638 (310 x 240 mm) pages, it would have been impossible to believe that Volume 2 of the *HANDBOOK OF THE BIRDS OF THE WORLD* could be better than its predecessor. For how do you improve on perfection? Only, one assumes, with the help of Divine Intervention. So, practically every other superlative that might be lavished on a work of this kind having been fully utilised, let me be the first to congratulate editors, Josep del Hoyo, Andrew Elliott and Jordi Sargatal on the quality of their connections!

Volume 2 covers New World Vultures to Guinea-fowl - in

summary, New World Vultures; Osprey; Kites, Hawks, Harriers, Eagles and Old World Vultures; Secretarybird; Caracaras and Falcons; Megapodes; Chachalacas, Guans and Curassows; Turkeys; Grouse; New World Quails; Partridges, Old World Quails, Francolins and Pheasants; Guineafowl.

There is much in this particular volume to interest aviculturists for it encompasses all presently known species (and significant subspecies) of diurnal Raptors and most of the Galliformes. So far as the latter are concerned, if you want to know more about the Hoatzin you will have to wait for Volume 3 (covering Hoatzin to Auks) which is scheduled for publication in mid-1996.

The second volume, as one would anticipate, closely follows the style of Volume 1 - descriptions of each family and species' accounts. The former are extremely comprehensive while the latter tend to be informative but concise. No matter where you look in these superlative early volumes you are unlikely to find yourself, as is the case with most other works other than monographs, short of information.

The two bird-keepers among our four sons now look forward eagerly to the appearance of a new volume of the HBW. For they know they will be the recipients of 'fallout' from my modest library of previously published works, some of them of recent origin, which are now being rendered almost obsolete by 'the' Handbook.

Illustrative content is brilliant - the publishers say they are '... probably the most original element of the work'. I would disagree - only to suggest they are 'one' of the most original elements.

Plates, by world famous artists, will depict for the first time *all* of the world's known bird species. Several figures have been painted for some species, illustrating sexual dimorphism, plus all relatively common morphs in polymorphic species, together with distinctive subspecies.

Photographs are again outstanding. For me one of the most pleasant surprises was to see, on page 435, a photograph of the Udzungwa Forest-partridge *Xenoperdix udzungwensis*. Discovered only in 1991, it was first believed to be a Francolin until, when scientifically described in early 1994, it was placed in a monotypic genus and is believed to be most closely related to Asia's Arborophila Hill-Partridges.

Now, knowing a little - just a little - about the publishing world, I can assure members that with a massive book of this kind, published in late 1994 and able to refer to material revealed only

a few months earlier - well, you really can't be more up-to-date than that.

There are many other photographs to add to the beautiful and valuable illustrative quality of the plates. I set out to draw attention to those that took my eye, but realised that, with at least 80%, for one reason or another, utterly eye-catching, space would not allow such an indulgence.

Volume 2 of the *HANDBOOK OF THE BIRDS OF THE WORLD* costs a cool £98.00 (plus £5.00 postage and packing).

Now why should you spend so much money on a bird book? I can tell you quickly and easily. Because until someone else with undreamed of connections comes along with a better idea, this looks likely to remain the definitive work for many years to come. And I suspect that cared-for volumes will appreciate rapidly in value.

The *HANDBOOK OF THE BIRDS OF THE WORLD* can be purchased in specialist bookshops or directly from the publishers - LYNX EDICIONS, Passeig de Gracia, 12, 08007 BARCELONA, Tel: 34-3 301 07 07. Fax: 34-3 302 14 75

F.W.

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With the publication last year of the long awaited Volumes VIII and IX, of *The Birds of the Western Palearctic*, this excellent and informative nine-volume set is now complete. A definitive work, it contains descriptions of more than 770 species which occur in the Western Palearctic and will be of value to aviculturists as well as professional and amateur ornithologists.

Contents of the nine volumes are (I) Ostrich to Ducks, (II) Hawks to Bustards, (III) Waders to Gulls, (IV) Terns to Woodpeckers, (V) Tyrant Flycatchers to Thrushes, (VI) Warblers, (VII) Flycatchers to Shrikes, (VIII) Crows to Finches, (IX) Buntings and New World Warblers. They account for 7,000 pages of reference and more 440 specially commissioned colour plates by leading artists including Norman Arlott, Trevor Boyer, C. E. Talbot-Kelly, Ian Lewington and Hilary Burn.

Sections are included on field characters, habitat, distribution, mortality, population, movements, food, social patterns and behaviour, breeding, voice, plumage, moult, measurements, weights, structure and geographical variation.

Volume VIII will be of considerable interest to many

aviculturists containing as it does detailed information about many popular European species with illustrations depicting the various races of Hawfinches, Bullfinches, Goldfinches, etc.

In its field this set is clearly and obviously an excellent successor to Witherby's classic *Handbook*. Chief Editor for the series was the late Stanley Cramp, with C. M. Perrins editing the final three volumes.

The Birds of the Western Palearctic is published by Oxford University Press, Walton Street, Oxford, OX2 6DP. Volume VIII costs £95.00, Volume IX costs £85.00 (both plus postage and packing). Also available from specialist booksellers.

F.W.

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FREDDIE COOKE

Frederick Charles Cooke, known to his many friends as 'Fred' or 'Freddie', died earlier this year following a long illness. He is survived by two sons from his first marriage, by his widow, Dulcie, her son and his children.

Freddie brought commitment, skill and enthusiasm to everything he did. At Worcester School he played rugby, ran for the school and sang in the choir of Worcester Cathedral.

Prior to the outbreak of World War II he was already a pilot in the Royal Air Force Volunteer Reserve. During the war he was in charge of a substantial number of engineers who serviced aircraft on Bomber Command's operational squadrons and was thus, to some degree, responsible for the lives of aircrew.

After the war he worked for many years for a major aircraft company, becoming a Director and travelling widely, mainly to America, Africa and Germany. He retired twice, but each time missed the pace of the business life to which he had become accustomed.

Following the death of his first wife, and with his sons already married, his marriage to Dulcie brought him into contact with a whole new world - aviculture. With customary enthusiasm, he equipped himself properly, immersing himself in activities ranging from the study of genetics to designing and constructing superb aviaries. He also lectured and chaired seminars, and with Dulcie wrote many articles and books on subjects connected with aviculture.

Dulcie, his two sons, their relatives and large circle of friends knew well the intense warmth of his personality, and in Dulcie's case the great love they shared during 21 years of marriage.

Freddie was also a quite splendid Grandfather, affectionately enthusiastic with even the youngest Grandchild. For the older ones - and at the age of 73 - he was the author of a simple manual dealing with computer skills.

His ability to make the best possible use of time was an inspiration to all who knew him, as was his great courage during a long illness.

He numbered many members of the Avicultural Society among his friends and will be greatly missed by all of them.

F.W.

MACAWS FLOCK TO SOTHEBY'S

Sotheby's are holding an exhibition, from Monday 17th to Friday 28th July (Monday to Friday, 9.00 am to 4.30 pm), to celebrate completion of what is described as '... one of the most ambitious publishing projects of the century'. Macaws are the subject of an exceptional limited edition of hand-coloured etchings by acclaimed artist, Elizabeth Butterworth. The edition of 50, entitled 'Macaws', consists of 12 life-size etchings. The project, which has taken 12 years, is the brainchild of specialist publisher and ornithologist, Rodolphe d'Erlanger.

The exhibition will include the artist's original sketches and watercolours alongside the etchings, and will be held at 34/35, New Bond Street, London, W1. Profits from the project will be donated to the Friends of the Peruvian Rainforest, who aim to secure one million acres of Peruvian rainforest in order to maintain the habitat of macaws and other wildlife in perpetuity.

'Macaws' was printed on handrolling etching presses - replicas of those used in the 18th and 19th centuries - but the sheer size of each image presented d'Erlanger's printers with a considerable challenge. No-one has ever attempted to overprint up to six plates with hair-line registration. For the 12 illustrations, 61 imperial copper plates were made, more than 350 specially mixed colours were used and, in one instance, 17 colours were inked onto a single plate.

Born in Lancashire and trained at the Rochdale School of Art, Elizabeth Butterworth completed her studies at the Royal College of Art, London. Since the mid-1970s she has had one-woman exhibitions in major world centres as well as taking part in group shows in the UK, USA and Japan. Her works are in many public collections including the Metropolitan Museum of Art and the Museum of Modern Art, New York, the Victoria and Albert Museum, London, the National Library of Australia, Canberra, and the Museo de Arte Contemporaneo de Caracas, Venezuela. Previous publications include *Parrots and Cockatoos* (1978, Fischer Fine Art, London) and *Parrots, Macaws, Cockatoos: the art of Elizabeth Butterworth* (1989, Abrams, New York).

Rodolphe d'Erlanger, a passionate ornithologist, commissioned Elizabeth Butterworth to paint a portrait of one of his parrots in 1977, and so began a creative partnership resulting in the award-winning monograph *Amazon Parrots* which was published by

d'Erlanger in 1983. Trained as a merchant banker, d'Erlanger served as a member of the Zoological Society's Parks and Gardens Committee and is actively committed to preserving the natural habitat of wildlife.

Each of the 50 editions of 'Macaws' is available in book form or in a presentation case, both covered in blue buckram with brass catches and scarlet leather titles.

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NEWS AND VIEWS

BREEDINGS AT BIRDPARK AVIFAUNA

Several species have already bred in 1995 at Birdpark Avifauna. As usual the first hatchings were in the Tropical Hall where Masked Plovers *Vanellus miles* hatched three chicks, with Blacksmith Plover *V. atratus* playing their part with three youngsters. All were parent-reared and it is a lovely sight to see how the adults take care of their offspring.

The same good care is also shown by pigeons, although they are not so aggressive as the plovers. Chicks have been hatched by Red-throated Ground Dove *Gallicolumba rufigula*, Black-chinned *Ptilinopus lechlancheri* and Orange-fronted Fruit Doves *P. aurantifrons*.

It was much more difficult to discover how many chicks the hen Red-billed Hornbill *Tockus erythrorhynchus* had in her nestbox and we had to wait to find out until four youngsters eventually fledged. Another hornbill species, Von der Decken's *T. deckeni*, has just muddled-in in an aviary outside the Tropical Hall. In 1994 this species successfully raised four chicks for us.

We were not successful in rearing our 13th Great Indian Hornbill *Buceros bicornis*. This year the two eggs were infertile. But we have new hopes concerning our Southern Ground Hornbills *Bucorvus leadbeateri*. Two eggs have been placed in an incubator and it seems they are fertile. I hope I can report a good result with this species later in the year.

Many birds laid early in their winter aviaries. These include Scarlet *Eucodimus ruber* and Puna Ibis *Plegadis ridgwayi*. Some of our birds do not experience any problems with low temperatures. Emu *Dromaius novaehollandiae*, and some waterfowl including Black Swan *Cygnus atratus* and Hawaiian Goose *Branta sandvicensis*, together with Jackass Penguin *Spheniscus demersus*, all laid eggs earlier this year.

On the subject of waterfowl, we discovered in the Tropical Hall that African Pygmy Geese *Nettapus auritus* were on a clutch of eight eggs. They raised seven youngsters last year so we are hopeful they will repeat that success in 1995.

We have some new birds as a result of exchanges with other zoos. We sent four Jackass Penguins to Hanover Zoo and received in return a pair of Violet Touraco *Musophaga violaceous*. We also received a cock Blue-winged Pitta *Pitta moluccensis* from Frankfurt Zoo.

Hans van der Sluis

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SPIX'S MACAW RELEASE

A female Spix's Macaw *Cyanopsitta spixii* was released back into the wild on 17th March 1995, marking the culmination of years of planning and preparation. The bird in question was hatched and reared in the wild but had spent many years in captivity in Brazil. Some six months prior to the release it was installed in a large, specially-designed cage to become used to the natural habitat environment of the site and the new food source which would form the basis of its diet once it was released. By mid-March members of the team, who had been carefully monitoring the bird for several months, decided the time was right for the release to take place.

The cage door was opened at 6.30 am and the macaw soon flew from the cage, initially covering about 300 metres before resting for a short period. It then flew a similar distance to land in a Pinhao tree where it spent its first night roosting at liberty. The monitoring team have reported that the bird has been seen to utilise other food types in addition to the Pinhao, which it had been fed during the adaptation period. It is not yet flying great distances but recordings of the vocalisation of the wild male Spix's Macaw (at present some distance away and still paired with an Illiger's Macaw *A. maracana*) are being played in an attempt to stimulate more momentum from the female.

Loro Parque Foundation

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GLOBAL WARMING LINK WITH EARLY NESTING?

Recent analyses of nesting data for many British birds, gathered by the British Trust for Ornithology, have shown a marked trend towards earlier nesting. This has been linked to global warming and has affected a number of species. Earlier this year, Humphrey Crick, nest Records Officer for the BTO, urged farmers and gardeners to take care, even at the end of March, when trimming hedges. Long-tailed Tits *Aegithalos caudatus* and Chaffinch *Fringilla coelebs* were on average a week earlier than in 1961 and 1976 respectively, and Greenfinches *Carduelis chloris* are 10 days earlier than they were in the early 1960s

* * *

TRAGOPANS FROM CHINA

Two recently arrived Cabot's Tragopans *Tragopan caboti* at San Diego Zoo are of particular significance because they are the first

birds of the species received in the United States from China in more than 20 years. They represent new bloodlines for the breeding programme and will help maintain genetic viability.

* * *

HAREWOOD'S ANNIVERSARY

Harewood Bird Gardens (Leeds) celebrated its 25th Anniversary on 25th March 1995. Already an ambitious building programme is planned for the years ahead and an interesting innovation this year is the introduction of an audio tour of the bird garden. Following an introduction by Lord Harewood, visitors are able to receive information about the collection as they walk around the garden. A number of rare species have been bred at Harewood since it opened, including a world 'first' with Giant Wood Rail *Eulabeornis ypecaha*. More recently the garden has enjoyed notable successes with Hoopoe *Upupa epops*, Palawan Peacock-Pheasant *Polyplectron emphanum*, Rothschild's Mynah *Leucopsar rothschildi* and other rare species.

* * *

NEW COTINGA

A new South American species, the Chestnut-bellied Cotinga *Doliornis remseni*, has been described. It was first observed in the Andes of southern Ecuador in 1989 and more sightings have followed in other parts of Ecuador as well as Peru and Colombia.

* * *

PROBLEMS FOR HOUSE FINCHES

In the USA, a mysterious affliction which is affecting eastern House Finch *Carpodacus mexicanus* populations has caught the attention of wildlife biologists and others with an interest in wild birds. The disease, an eye infection, has been confirmed in House Finches in half a dozen eastern states, but in October 1994 no cases had been reported in Canada. Infected birds have swollen, puffy faces or runny or crusted eyes. The prime suspect is the microorganism *Mycoplasma gallicepticum*, usually a disease affecting poultry. It poses no risk to human beings.

Living Bird.

* * *

NIGHTJARS INCREASE

The recently published results of a British Trust for Ornithology/Royal Society for the Protection of Birds survey has revealed that there are now 3,400 'churring' male Nightjars *Caprimulgus europaeus* in the UK, an increase of 75% on the 1981 figure. The survey also shows that the Nightjar's range has expanded since 1981, with 13 counties reoccupied. Key to the change appears to be the creation of suitable habitat following the amount of forestry plantation clearfelled and restocked since 1981, providing the open conditions required by breeding Nightjars.

BTO News

* * *

BALD EAGLES BREED

Bald Eagles *Haliaeetus leucocephalus* in the collection at Christopher Marler's Flamingo Gardens and Zoological Park at Weston Underwood, Bucks. have continued their remarkable breeding record this year. Two more youngsters have hatched making a total of 15 reared by one pair since 1986.

* * *

EUROPEAN ZOO TOUR

Following successful visits to The Netherlands and Germany, the 1995 European Zoo Tour, which takes place in September, will visit Antwerp Zoo, Walsrode Bird Park, Apeldoorn Primate Center and Hanover Zoo. Full details are available from John Partridge, 2A Northcote Road, Clifton, Bristol, BS8 3HB.

The tour is aimed at those people interested in zoos and what goes on within them. In past years there has been a mix of people including zoo professionals, ex-keepers and others who regularly visit zoos. Wherever possible, short tours or a brief introduction to the zoo in question are arranged on the day of the visit.

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THE AVICULTURAL SOCIETY

The Avicultural Society was founded in 1894 for the study of British and foreign birds in freedom and captivity. The Society is international in character, having members throughout the world.

Membership subscription rates per annum for 1995 as for 1994: British Isles £18.00: Overseas £21.00 (plus £6.00 for airmail). (U.K. funds please). The subscription is due on **1st January of each year** and those joining the Society later in the year will receive back numbers of the current volume of the AVICULTURAL MAGAZINE.

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ADDRESS OF THE EDITOR

Frank Woolham, Hon. Editor, The Avicultural Magazine, 32, Caughall Road, Upton-by-Chester, Chester, CH2 1LP. England.

AVICULTURAL MAGAZINE

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EDITORIAL

I hope Members will agree that it is good to see London Zoo Notes reappearing in the *Avicultural Magazine* after an absence of several years. Senior Curator, Simon Tonge has promised to supply notes on a regular basis and it will be interesting to read of the changes that are being made in the Regent's Park collection in the months and years ahead.

The magazine (or rather its Editor) is again suffering from a disturbing lack of material for inclusion between its covers. Much has been promised from around the world and, in fairness, much has been delivered. But during 1995 several commitments have yet to be honoured and I ask the people concerned to try to devote a little time to writing original material about the interesting avicultural experiences in which they have been involved.

At a recent Council Meeting, the Society's Chairman, Professor J. R. Hodges asked that in future a brief summary of all such meetings should be reported in the *Avicultural Magazine* - please see page 82.

F.W.

* * *

BREEDING THE RED-TAILED AMAZON AT THE TROPICAL BIRD GARDENS

By Mike Curzon (Rode, Somerset).

The Red-tailed Amazon *Amazona brasiliensis* is listed in Appendix 1 of CITES. The species is found in south-eastern Brazil and in his second (revised) edition of *Parrots of the World* (Lansdowne Editions, Melbourne, 1978), Forshaw makes no reference to having seen the species in the wild. The illustration by Cooper in the same work was painted in 1972. It shows a bird with a darker back and with more yellow in the tail than the birds at Rode. Could it be that coloration deepens with age? Certainly the colour of our birds has intensified over the past 3½ years. So far as I am aware, the only colour illustration of the Red-tailed Amazon to have appeared in the *Avicultural Magazine* was in January/February 1960 when a colour photograph was reproduced. The bird in question was owned by P. H. Maxwell.

In those days the quality of colour photography and reproduction of prints and transparencies was not very good compared to the standards being achieved today. Any members who are fortunate enough to have Rosemary Low's *Amazon Parrots* will see the species depicted in a plate by Elizabeth Butterworth which is much more in line with the birds we have in the collection here.

HM Customs and Excise offered us four birds, which had previously been confiscated, in September 1991. You can imagine our surprise and delight at being given an opportunity to work with this relatively unknown Amazon. The birds' ages were unknown and all were extremely timid. Therefore, they were allowed time to settle down.

The sexes are similar in appearance and the four birds paired up as we had believed they would. However, to ensure that all was well they were surgically sexed and microchipped in the autumn of 1993. One pair was believed to be mature, but in the case of the second pair ('B') the cock was an immature.

The birds were housed in identical aviaries, in the same range, in an off-display area, each being 15 ft. x 5 ft. x 7.5 ft. high. There is a half open-fronted shelter at the rear and the birds receive early morning sun. As previously stated, they were extremely nervous when first received from the quarantine station and took longer to settle down than any other species of Amazon we have had at Rode.

Their diet consists of a mixture of sunflower, safflower, buckwheat, mixed soaked pulses (soaked for 24 hours), peanuts, fruits in season and root vegetables (mainly beetroot and carrots) although only one pair will consume these latter items.

The following notes relate only to pair 'B'.

Our standard Amazon nestbox measures 20 in x 10 in x 10 in. The first box was put into position at the back of the aviary, alongside the shelter but with the entrance hole facing the other way to give maximum privacy. During 1993 the pair did nothing other than play around with the box and roosted outside at night.

Neighbouring birds were a pair of Hahn's Macaws *Diopsittaca nobilis*, in an aviary to the left while that on the right was empty. Early in 1994 a second nestbox was placed inside the shelter, immediately behind the door. Both boxes were used but it was the second of them that was eventually selected by the pair. We had placed pieces of rotten wood in the base and these were chewed by the female.

Two eggs were seen on 20th May and the birds were left undisturbed. On 17th June our Head Keeper, John Meeke looked into the box and saw two chicks and one egg; one of the chicks was recently hatched. The adults were not very vocal - which is unusual compared to our other breeding pairs of Amazons. The parents had a craving for dandelions, loving the flowers, plus fruit and vegetables.

We knew from the food intake that the chick was alive. The question in our minds was whether it was alone. As time went by we became even more convinced that it was single chick and as long as food was taken to the box we were not going to interfere. Perhaps if we are fortunate enough to breed the species in the future, more inspections will take place, but this is something which will have to be evaluated.

The great day arrived on 22nd August when a chick was seen looking out of the nestbox. It fledged six days later on 28th August. It was seen feeding itself on 10th September. The fate of the second chick and the remaining egg is unknown.

The young bird was sexed that autumn and proved to be a male. It has less red on the head and a face that is best described as a diluted version of its parents. It is a very attractive bird.

At the time of writing (April 1995) it has gained more colour. It may well be that as it continues to colour in the years ahead, we will be able to work out how old its parents were when they arrived here. The young bird spent the 1994/5 winter alone in a smaller aviary but

within hearing distance of its parents.

Pair 'A' have done nothing other than play around in their nestbox.

For those interested, this is believed to be a first UK and European breeding, and possibly a world 'first'. The Stud Book for the Red-tailed Amazon is kept by Dr. H. Lucher, Director of Zoo Dresden. In addition to the birds at Rode, others of the species are held at Loro Parque, Palmitos Parque, Zoo Dresden and the World Parrot Trust at Hayle (Cornwall).

There may, of course, be other birds in other hands and anyone who is aware of such birds is asked to get in touch with the Stud Book Co-ordinator.

The following is an extract from an HM Customs and Excise press release dated 11th August 1994 -

One pair of Red-tailed Amazon parrots, seized together with nine similar birds by Customs in East Anglia during 1991, and subsequently housed at The Tropical Bird Gardens, Rode, near Bath, have recently successfully produced a chick which will shortly leave its nest. This is very good news for Red-tailed Amazons as they are considered threatened with extinction and prohibited from being exported from their native Brazilian habitat. Trade in the birds is more generally prohibited by their being listed in Appendix 1 (the highest category of protection) of the Convention on International Trade in Endangered Species, to which the UK and many other states are signatories.

Customs are delighted that the birds have prospered at Rode and look forward to hearing of further chicks being produced to add to, rather than diminish, the world's population of parrots.

* * *

SUCCESSFUL BREEDING IN A SMALL COLONY OF GREATER FLAMINGOS

By Clément Lanthier
(Veterinarian/Curator, Granby, Québec)

Summary

Flamingos have been displayed for decades in captivity. Considering the number of specimens and groups, there has been little success in reproduction. Efforts to adapt the environment and management of relatively small flocks of Greater Flamingos *Phoenicopterus ruber* have been successful in breeding this species. Simulating large flocks with the use of walled mirrors, adequate substrate, sufficient lighting, privacy and proper nutrition are believed to be major factors in reproducing small flamingo groups in captivity.

Considering the number of flamingo *Phoenicopterus sp.* groups listed in the International Species Information System (ISIS) Bird Abstract, it is surprising that captive reproduction is still erratic. Independent of species, 5,214 flamingos, distributed in 147 groups, were listed in the December 1992 Abstract. Forty-three of these groups reproduced in 1992, for a total of 136 hatchings. This poor breeding performance indicates the need to improve the captive management of flamingos. This short paper describes our practical experience in maintaining and breeding a relatively small group of Greater Flamingos *Phoenicopterus ruber* at the Granby Zoological Garden.

Captive Environment

Canada is obviously not the ideal place for flamingos. Seasonal temperature variations are so large that Canadian institutions who decide to keep flamingos outdoor in summer need an alternative enclosure for winter months. Preferably, summer and winter quarters should be designed to give birds the opportunity to walk in and out when seasons change. However in Granby, we have to catch the birds twice a year to relocate them. This is certainly stressful but no injury has occurred so far. Winter housing temperatures in Granby are held near 21° Celcius.

The winter and breeding housing is relatively small: the flock has access to 36.2 m² of which 36% is water (figure 1). The pond is divided in two levels. A shallow area (10cm deep, 30 cm wide)

outlines the deeper portion of the pond (37.5 cm). The junction is progressive so birds can walk easily in and out. The pond is made of concrete and is surrounded by a 7.5 cm high wooden edge to keep nesting substrate out of the water.

The thickness of the nesting substrate varies from 7.5 cm to almost 1 m. where nests are erected. Flamingos are quite unique nest builders. They build monticules of soft, damp material. We provide a peatmoss and straw mix and keep it constantly and appropriately damp. Other institutions have used mud or sea sand mixed with a little clay or earth to bind (Kear, 1974) which is also successful. Nesting substrate is offered indoors and outdoors but so far flamingos have only been interested in breeding indoors.

The humidity level of the substrate is re-evaluated twice a day by keepers. Showers (simulated rain) are not sufficient to keep the substrate damp. Perforated hoses are run under the substrate's surface so keepers can control the humidity. In the winter housing, the ceiling sprinkler is turned on twice a day for approximately one minute. Because rain sprinklers have no significant effect on the frequency of group display behaviour (Stevens, 1991), keepers have discontinued this practice when birds begin to build their nests. However, we have found that temperate showers are useful in keeping the substrate damp and plumage clean. In the summer, natural sunlight is more than sufficient. Flamingos prefer to stand in a sunny area of their enclosure and rarely stand in the shade. Appropriate winter housing lighting is important. Both quality and quantity must be planned carefully. Wide-spectrum fluorescent lighting (Spectralite) is used for the flamingo group in Granby. Natural daylight in our region is less than 10 hours per day in January. We artificially alter the photoperiod in order to stimulate the birds to reproduce (courtship, nest building, egg-laying, incubation ...) before relocating them to their summer enclosure for public viewing; we initiate an "early" spring. In January, indoor lights are on 11 hours a day and then, 15 minutes are added weekly until 14 hours of light per day is provided (mid-March). High pressure sodium lighting (Lumalux 150 watts) also varies under the same protocol. This very bright light simulates sunrays and occasionally the birds are seen facing the lights sunning themselves with their wings opened. These lights, which are approximately 3 m. from the floor produce this particular light that appears to be sporadically attractive to the flamingos.

Flock Constitution

Fifteen birds constitute our flock: eight males and seven females

sexed by measures of tarsal length (Richter, 1991; Studer-Thiersch, 1986) and confirmed by laparoscopy. All flamingos (except last year's male chick) were acquired as adults 14 years ago. It has been reported that all captive Caribbean flocks over 20 birds have successfully reared chicks (Pickering, 1992). However, the smallest Greater Flamingo flock known to rear a chick was one of 14 birds (Pickering et al, 1992). The size of our flamingo group could constitute a serious handicap to our efforts to breed the species in Granby. To simulate a larger flock of birds, we installed mirrors on three of the walls surrounding the nesting area of the winter quarters (figure 1). When exposed to the mirrors, the birds almost immediately began to display. The mirror's effect lured them into believing there were many more than were really present.

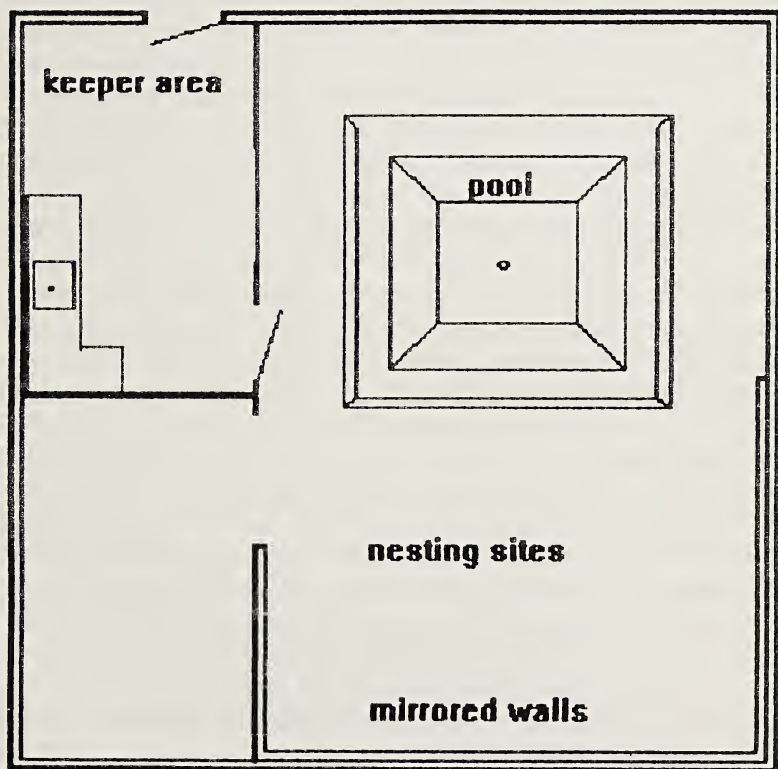


Figure 1
Flamingo breeding indoor enclosure [1:100]

Management

To keep birds in the outdoor enclosure, the flight feathers of one wing are trimmed (Sedgewick, 1967) in late spring, at the time of their relocation from the winter housing to the outdoor enclosure, except for three females and three males that have had one wing partially amputated. Unfortunately, our observations don't permit at this point to elaborate on pair fidelity. Records of pairing prior to 1992 are not available. The Granby Zoological Garden is seasonally opened to the public (May to September). Furthermore, access to the flamingo winter housing is restricted to a very few personnel. It is important to minimise disturbance. Keeper observations are possible from an unidirectional glass window (figure 1).

The pool is cleaned on a daily basis and feed is offered at the same time. Mirrors are hosed regularly until the birds begin to lay their eggs. The Flamingos are fed a specialised commercial diet (Zeigler flamingo fancier diet) developed to replace supplements of shrimp, fish and colouring agents. It contains a minimum of 22% crude protein, a minimum of 5% crude fat, a minimum of 15% moisture, 2860 kcal/kg metabolizable energy, a maximum of 4.5% crude fibre and a maximum of 6.5% ash. In nature, flamingos feed on items that contain very high levels of protein such as the blue-green algae *Spirulina*, which is 60% protein (dry weight) (Kear, 1986). Considering the potential need of higher protein intake to stimulate the birds to breed, we provided a higher protein diet. From February until hatching time, their diet is changed to a second commercial flamingo diet: Mazuri flamingo breeder. This diet consists of not less than 34% crude protein and a minimum of 5% crude fat, no more than 7% crude fibre, a maximum 12% ash and 3.5% added mineral. Mazuri flamingo breeder tends to be accepted when moistened in water and Zeigler flamingo fancier diet is accepted dry and subsequently, moistened by the birds. Generally, the food is presented in a raised trough over the pond, and when young chicks are present, in a dish placed on the ground. To minimise disturbance of the nesting area and spoiling of food, dry Zeigler flamingo fancier diet is placed in a dish. Finally during the past year we identified each specimen with large engraved numbers in two-layer laminated coloured plastic leg bands (Shannon, 1992) and closely monitored the pairs.

Reproduction History

Gradually over the years, we have substantially modified the environment and the birds have responded favourably to the improvement. Before 1988, keepers reported that the birds sporadi-

cally played with the substrate, forming small mounds. During the winter of 1989-1990, lighting timers (protocol described earlier) were installed and man-made nests were built to stimulate birds to nest. Copulation was observed in May and one egg was laid in June. Unfortunately, the egg was infertile. In August 1990, it was decided to change the "traditional" in-house flamingo diet for a commercial one. Later that same year, mirrors were installed on three walls and finally, high pressure sodium lights were fixed on the ceiling. Again, no chick hatched but one egg was definitely fertile (dead embryo).

In the winter of 1991 - 1992, four eggs were laid, 16th April, 3rd and 4th May and 8th June. Unfortunately, it was not possible to clearly identify each parent from a distance. Finally on 14th May 1992, the first flamingo hatched at the Granby Zoological Garden. The 1992 - 93 winter was even more promising: 12 of the 15 birds were paired (14 adults and the 1992 subadult) six females laid eggs and three of them laid twice. The proportion of birds relaying after losing an egg during incubation depends of the season and whether the egg was lost naturally or removed by the staff (Pickering, 1992). In Granby, relaying was induced when eggs were lost (buried in the nest, or in one case rolled down by a competitive neighbouring pair). Again, only one chick hatched and all other eggs were infertile.

The proven-breeder male is one of the partially amputated birds. This observation eliminates the possibility of complete failure to copulate because of amputation. There are reports that flamingos held full-winged had a higher breeding success rate (Pickering, 1992).

As described in this paper, the captive winter housing environment changed progressively over the past years. We cannot identify the precise factor that initiated breeding in our flamingo group. However, we believe the key to successful captive breeding of this species which nests naturally in a large colony is to simulate the social environment of the colony, in this case through the use of mirrors to "multiply" the apparent size of the flock. Knowledge of natural biology, imagination and innovation can yield successful captive breeding of species that still reproduce erratically in captivity.

PRODUCTS MENTIONED IN THE TEXT

Lumalux: high pressure sodium lights, manufactured by Sylvania, Osram, 2001 Drew Road, Mississauga, ON, L5S 1S4 Canada.

Mazuri flamingo breeder: flamingo breeder diet, manufactured by Mazuri Purina Mills, Specialty Business Group, P.O. Box 66812, St. Louis, MO, 63166-6812, USA.

Zeigler flamingo fancier diet: flamingo diet, manufactured by Zeigler Bros. Inc., P.O. Box 95, Gardners, PA, 17324-0095, USA.

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* * *

STELLA'S LORIKEET

By Dulcie Cooke, (Epsom, Surrey)

The grace and beauty of *Charmosyna papou goliathina*, usually known in the UK as Stella's Lorikeet makes it one of the most desirable of all aviary subjects.

The true Stella's can be found in Joseph Forshaw's *Parrots of the World* under the title *Charmosyna papou stellae*, but in my third edition of this great work he points out that *papou goliathina* is also called Stella's Lorikeet.

In their wild state these birds inhabit forested areas of the mountains of central New Guinea, at between 1500 m and 3500 m. There are two forms of these birds, the strikingly beautiful red, and the melanistic, whose feathers have a velvety texture seen in few other birds.

The red cock has a red head, face and body, the lower breast and "trousers" are black, the wings are green, the tail is green and yellow, there is a brilliant blue patch on the rump and the feet are pink to scarlet. The eyes are orange and the beak is red, almost crimson at times in healthy adult birds. There is no problem sexing Stella's, the red hen has a large amount of deep golden yellow on her rump and she also carries the lovely blue on her back between the yellow feathers. Both birds have a large black patch on the back of the head in the centre of which is a cluster of green and blue feathers which can be slightly raised at times.

In the melanistic form the red is replaced by velvety black which gleams in the sunlight and often in the case of the cock there is a strong hint of red in the feathers on the breast. It is the cock which has a different colour on his rump, a brilliant scarlet or crimson which shows every time he flies, making him a most outstandingly beautiful bird. The eyes and feet, also the beak are the same colours as for the red form, but in the case of the melanistic the patch on the back of the head in both cocks and hens is bright blue, much brighter and lighter than on the red birds.

Stella's are extremely playful active birds which not only need plenty of flying space and branches to play with, but they also spend quite a lot of time on the ground, playing and rolling over and over like puppies. This and the climbing they do makes their tail feathers break when they are young. It may be necessary to pull out broken feather to allow others to grow. In reasonably mild or warm

weather a daily light spray with a plant sprayer helps.

A flight 3 m x 1 m x 2 m high is suitable. It is advisable to lay paving or ornamental stones on the floor, one quarter of an inch apart to allow for drainage. Double wiring is essential because the birds spend so much time clambering up and down the wire sides of their aviary, also their extremely incurved toes and claws make them quite unable to get off the wire quickly in case of danger. It is best to cover the flight roof with P.V.C. corrugated sheets, allowing a good "drop" for drainage.

My late husband always built a low wall of ornamental stone-coloured bricks round each flight and into this he rawlplugged the aviary panels. The appearance is pleasant, the aviaries do not blow away in gales and storms, and the birds feel secure when they are on the ground. With such fast moving birds double doors (an entrance porch) is really essential.

A house 1 m square is quite sufficient, but it should be a whole house, one going right down to the ground, we found over the years that Stella's would not go into their nest boxes in a "half" house where they must be placed on the floor of the house. It seems that they want to feel there is space and air under the box. Given a nest box in a whole house even very young Stella's will learn to use the box at night, thus keeping themselves warm. I believe it is very necessary in cold climates, such as in the UK, to interline the roof with plywood and about 4 in. (10 cm) of insulating material.

On the subject of nest boxes I have come to the conclusion that Stella's like very big boxes; mine are 11 in. (28 cm) square by 2 in. (60 cm) deep, with of course a ladder and inspection door. The entrance hole needs to be large, 2½ - 3 in. (7 - 8 cm) and wood shavings to a depth of about 6 in. (15 cm) are needed.

My Stella's have always bred in nest boxes hung in their houses, they breed round the year once they start at about three-and-a-half to four years of age. There is a much better chance of rearing winter babies if tubular heating is installed and the temperature kept to about 60° F. A low light at night is essential to enable the parents to feed their young early and late.

The two eggs take about 24 days to hatch and from the second or third day onwards it is necessary to clean out the top few handfuls of wood shavings and replace them with clean warm ones. The babies are best put in a warmed tissue-lined box while this work is completed. At about nine to ten weeks the young will leave the nest, sometimes a little earlier. The parents are good-tempered with their young, but they should be removed at once if the hen

starts to lay again.

In a lifetime of keeping so many kinds of birds I know of very few with such extraordinarily expressive eyes as Stella's Lorikeets. Delight, affection, love of their owner and of each other, anger, fear and frustration are all there for the observant and understanding person to see. Of course, too, the swaying body of the female says clearly, don't come near me or my babies! The only exception to this is when she wants her babies made clean and warm for the day; but be warned, either or both parents in some cases can be very aggressive when they are breeding. If this is the case, wear glasses to protect the eyes and a glove on one hand.

Stella's are not such avid chewers of wood as many lorries and lorikeets but nevertheless they enjoy small branches of willow, hazel nut or sweet apple. They will chew the bark thereby giving themselves a dose of Biotin which I understand is just below the bark. Biotin helps to prevent rickets. The greatest treat one can give these birds is a small bunch of flowers wired to a perch with very thin wire, the birds get tremendous pleasure from extracting the nectar, eating the pollen and in some cases the petals. Many garden shrubs and flowers are poisonous, for example, every part of the rhododendron is poisonous. The following can safely be given to the birds: forget-me-nots, wallflowers, pansies, bedding begonias, impatiens (busy lizzies), fuchsias, antirrhinums, roses and white bedding alyssum. All bulbs should be avoided.

There are many excellent nectars and dry foods on the market, but I have always made up my own mixtures, both dry food, of which Stella's are very fond, and nectar. Dry food must always be placed near to a water container and needs to be changed daily. Nectar is fed fresh and warm twice daily and three times daily when the parents have young in the nest. The following are the nectar and dry food mixtures I have used for some years now with success. It will be noticed that there is no soya flour in my mixtures, I believe Stella's are better without this food. Both dry food and nectar mixtures contain approximately 13% protein.

Dry Food

6 handfuls (6 oz.) Sainsbury's instant hot oat cereal
(or other *instant* pre-cooked cereal)

3 tablespoons granulated cane sugar

1 level tablespoon wheat bran (from pet shops)

2 handfuls (2 oz.) dextrose or glucose

3 handfuls (3 oz.) ground rice (from supermarkets)

Mix all together, keep dry and covered, mix fresh every 2 - 3

days. Put one tablespoonful per two birds in a container next to water and change daily. Some birds like a few tiny pieces of sweet apple on top.

Nectar

To make approximately one pint of nectar:

- | | |
|--------------------------------------------------------|--------------------------------------------------------------------------------|
| One handful (1 oz.) | Sainsbury's instant hot oat cereal
(other pre-cooked cereals could be used) |
| Half a level tablespoonful (about one third of an oz.) | muscovado medium or light brown sugar |
| One tablespoonful (1 oz.) | glucose or dextrose |
| One tablespoonful (one third of an oz.) | liquidised peeled and cored sweet apple. |
| One teaspoonful | pure honey |

Mix all together with a little cold water, then add boiling water to bring to anything between three quarters of a pint and one and a quarter pints which will make a fairly thin mixture suitable for Stella's in mild and warm weather; it needs to be a little thicker in cold weather. Give to the birds warm at the rate of 150 to 200 milligrams per two birds; this is assuming they are being fed twice per day, three times when breeding. Into each container put two sugar cube sized pieces of sponge cake. Anything left over will be a "sludge" which can be put into a bowl and given to the wild birds, they will all enjoy this food.

To the above mixture, in *one* feed twice per week, add one large teaspoonful of Boots or other malt with cod liver oil. In *one* feed per day, add one *tablespoonful* of Birdquest's high protein nectar, made up according to their instructions, it needs fast heating to dissolve the "bubbles". The only time the birds do not receive the high protein nectar is the first three days of babies' lives. Sometimes young hens start to lay at too early an age for the good of their future health, in this case stop giving the high protein nectar until they are fully matured.

Young Stella's breeding for the first time often make mistakes like all other birds. The cock is supposed to do his share of brooding the eggs, usually in the day, but young cocks very often neglect their duties! This means that the poor young hen gets all the sitting to do, gets hungry and tired and often leaves the nest, sometimes just as the babies are about to hatch. Some pairs will "kick their

eggs around" and then desert them. One reason is that the box may be too small, and another reason is if the owner or carer disturbs the birds too much out of anxiety to know whether or not they are laying or sitting. Provided that the nest box is reasonably dry, leave the birds alone, they will both come and tell their owner when they want some attention paid to them in the form of praise and encouragement for their efforts! All lories and lorikeets want praise etc. at the right time, and Stella's are no exception. Only when it is obvious that there are young in the box must it be cleaned out (partially) each day.

Stella's have very volatile personalities and during brooding and for the first two weeks of the babies' lives they can be extremely aggressive, so the owner or carer needs in the case of some pairs to wear glasses to protect the eyes and a glove on one hand.

A small piece of green lettuce leaf well washed is given to the birds daily round the year, and to this is added any of the flowers mentioned when available.

Finally a word of warning, never buy a Stella with a white beak, either the bird is old, has been given too many antibiotics, or he or she is suffering from fatty liver or something similar. The best way to obtain birds is from known breeders, which may mean waiting for them.

These beautiful, affectionate and intelligent birds will amply repay their owner for the care and attention which they so much deserve.

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OBSERVATIONS OF UNUSUAL BEHAVIOUR IN MUNIAS, GENUS *LONCHURA*.

By Robin Restall, Hong Kong

Introduction

In 1984 I moved from Tokyo to London. During the four years in Japan I kept many birds but only managed to keep one species of munia, the Java Sparrow. For the next five years in England I managed to acquire several species of munia for study purposes. Then, from 1989 to 1995, I lived in the territory of Hong Kong. During this time I spent a considerable amount of time researching for a monograph on the genus *Lonchura* (Restall *in pub.*) I maintained an extensive collection of munias for direct observations, and made observations in the field in most of the countries of Asia Pacific and South Africa. During this time I recorded several instances of unusual behaviour which are described below. It is quite possible that earlier workers have recorded some or even all of these before, and I have missed them. I have given acknowledgements wherever directly attributable.

Wing-raising in Asian Munias.

The wing-raising behaviour of the *Spermestes* subgenus of African mannikins is well recorded (e.g. Morris 1958, and others). It may occur when a juvenile is begging to be fed. It may be possible that by raising the far-side wing, the juvenile is communicating an impression of larger size, and is thereby increasing the stimulus to the parent to feed it. This thesis is supported by evidence in other groups of birds such as the case of the European Cuckoo, where it seems the larger size of the baby, possibly in some way representing the sum visual stimulus of several babies, stimulates the foster parents to abnormal efforts to satisfy its hunger. In a brood competitive situation the larger birds get fed first, and this too may be the key factor in the wing-raising behaviour among mannikins, the wing-raising effectively obscuring the other fledglings from view. Wing-raising may also occur in an aggression-defence situation, when the raising of the far-side wing increases the apparent size of the bird being attacked and will thus intimidate or inhibit the other bird from aggression by communicating that its opponent is bigger than was realised. Wing-raising appears to have been recorded only in the Pectoral Mannikin among the Asian munias. I have observed wing-raising in three other species of munia in Asia, as follows.

I first saw wing-raising as a defence behaviour by the Philippine Scaly-breasted Munia *Lonchura punctulata cabanisi* on two different occasions. In each case, the wing-raising bird was a first year male in a cage with a second year male White-bellied Munia *L. leucogastra*. The White-bellied Munia had approached the other bird suddenly, almost certainly due to my presence startling it, which in turn startled the Scaly-breasted Munia into an immediate defence behaviour since it had nowhere to fly to. The birds in question were at the time in a cage in my studio in Hong Kong. Subsequently, under fairly similar circumstances, I observed two different adult Brown-headed Munias wing-raising against perceived threats from other munias. Interesting perhaps is that in none of these cases was the threat actually real, and I saw no actual aggression.

The third instance occurred in northern Sulawesi where I was on a business trip, in February, 1995. I had the opportunity to observe a small colony of Chestnut Munias *L. atricapilla jagori* in the grounds of the hotel where I was staying in Manado. There were four or possibly five broods of newly-fledged munias, 17 in all, that formed what amounted to a creche. They stayed close together, would hop about the lawn in an area covering a few square metres, but most of the time would sit in rows on the uppermost, fairly bare branches of two small bougainvillea bushes in the lawn. These bushes were small enough and low enough, and the fledglings so new to the world and innocent, that I was able to slowly walk up to one bush and pick off one of the babies with my hand. It still had soft papillae at the corners of the gape and could only have fledged a day or two earlier. I was able to sketch the gape markings of this bird. I estimated all 17 fledglings to be about the same age, suggesting an interesting synchronisation of nesting behaviour. They would sit quietly waiting until an adult appeared with clear intent to feed. It would invariably land at one end of the bougainvillea branch and the baby bird nearest would immediately assume a begging posture, head down and twisted upwards. After feeding it briefly, whereupon the intensity of the begging would reduce, the next fledgling in line would usually intensify its begging. On one occasion I saw the bird being fed raise its far wing in exactly the manner of a fledgling African mannikin, effectively blocking the next bird in-line from view as well as enhancing its own visual impact. I saw this again on two more occasions, but was uncertain of the accuracy of my observations the third time. This was because of the agitated crowding of the next bird in line, I could

not be certain the wing-raising bird was not simply the feeding bird trying to maintain its balance.

Creche Feeding

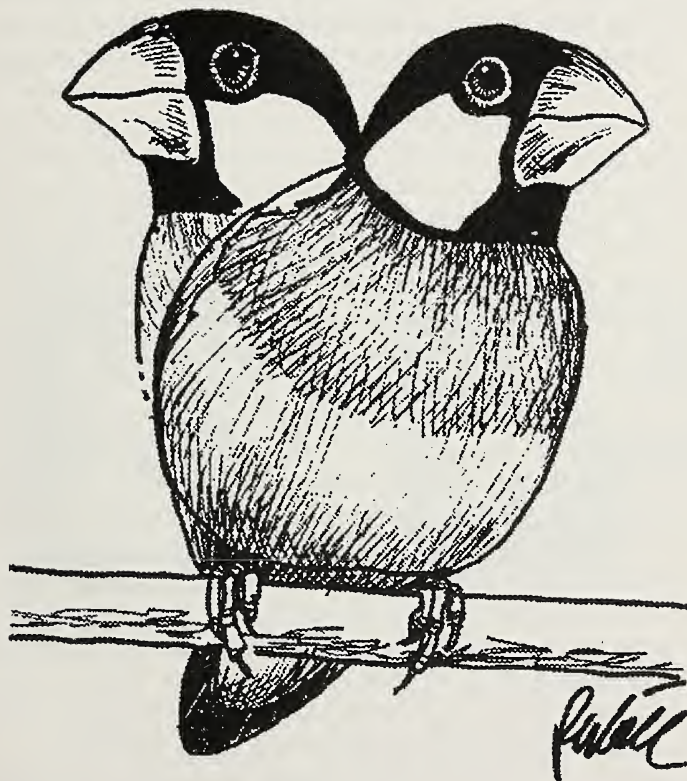
The Chestnut Munias in the garden of the Manado hotel formed several small colonies within each of which the breeding behaviour was apparently perfectly synchronised. Each colony was not necessarily in sync with the next one however. In one there was much displaying and singing, including peering, with males bringing thin lengths of palm leaves and females coming to the entrances of the nests to see what was going on. In the small colony outside the dining room balcony, from which I made most of my observations, only a few adults were in evidence. As far as I could tell only three adults were regularly feeding the 17 fledglings, (baby birds that had very recently left the nest). At least three adults were spending considerable time in the nests, possibly the females renovating. I think there were eight adults in all, with four nests, each in a different bamboo bush. After watching the feeding process many times I came to the conclusion that a visiting adult, whilst it almost certainly began by flying to one of its own brood, would feed whichever fledgling was next in the begging line. I managed to keep visual tabs on several individual fledglings and was sure that at least two had been fed by each of the three feeding adults. In my field notes I called it the Soup Kitchen Syndrome, but the fact that the baby birds behaved absolutely as if they were in a well-ordered creche prompts me to call this behaviour Creche Feeding. This behaviour is not unknown in aviculture, where adults have been seen to feed, sometimes regularly, begging fledglings of other species. But the observations described here were under perfectly natural conditions. I understand from my friend Derek Goodwin, who offered some pertinent comments on this paper, that when birds in a situation like this have been marked, and identification quite certain, only the feeding bird's own young are *voluntarily* fed. As described above in the section on wing-raising, in at least two or three instance, it was the action of the wing-raising fledgling that enabled it to be fed by blocking the view of the bird next in line, and not that the feeding bird simply "went down a line in the soup kitchen", even though that was the impression given..

Cavity defence head-twisting.

While living in Japan I decided to try the Japanese technique of hand-rearing young finches and bought a pair of, about, 10-day old Java Sparrows. These I reared easily by means of a purpose-made tubular syringe sold in pet shops. The two thrived and grew into

healthy young birds. They showed no fear of me or my family, and behaved *almost* as if they were imprinted onto humans. When they moulted into first adult plumage however, they lost their trust in us and behaved just like normal domestic Java Sparrows. They did not show fear of us, but avoided contact, would not be touched or picked up and were so independent that they had to be permanently caged.

One day, while working on the balcony where the cages were kept, I turned the corner and confronted one of the Java Sparrows as it sat in a small study cage facing me. Normally, a bird would turn and hop or fly to a further perch in an instinctive gesture of escape-intention, most munias would fly to the bars on the side of the cage and cling there while evaluating the situation. On this occasion, the Java Sparrow lowered itself on the perch, crouching slightly, and, looking directly at me, moved its head deliberately,



Java Sparrow twisting its head from side to side, showing alternate cheek patches.

twisting it from side to side, In this manner it presented first one side of the head, then the other. I stood still and after only a few movements the head-twisting stopped. I then took a small step towards the bird and it repeated the display. I was able to provoke the head-twisting by leaning forward, and having it cease by leaning back and ceasing movement. When I stepped deliberately closer the bird flew back off the perch and that was the end of it.

The behaviour was noted in my bird diary and forgotten until an identical behaviour occurred with a captive Japanese Great Tit that I was painting. I found that this bird would regularly give me the same display, which I take to be derived from a nest cavity defence behaviour.

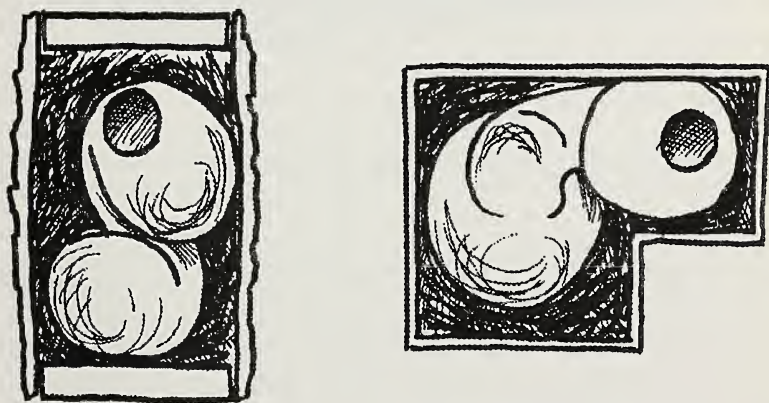
Cock's nest

It is well known (e.g., Goodwin 1982, and others) that most of the *Estrilda* waxbills build an unusually complex double-chambered nest. The nest cavity, within which the eggs are laid, hatched and the young reared, is in the main structure. Above this is a smaller comparatively incomplete structure that is used by the male to roost in. Some mannikins build nests for roosting in, some of which are decidedly communal in their use. But these are not used for breeding purposes. They are quite separate and apart from the nests built for breeding. The cock's nest of the *Estrilda* variety has not been previously recorded for any species of *Lonchura*. There have been three instances of cock's nests being built by munias in my bird room, that I describe below.

The first case was the Timor Sparrow *L. fuscata*. A pair went to nest in a typical wooden nest box of the kind used for breeding lovebirds. This box was about two metres from the ground, near to the door into the birdroom. The male Timor Sparrow would lie up in the cavity nearest the entrance, while the female brooded the eggs in the nest chamber proper, further within the box. Whenever I entered the room, within a moment the male would fly out of the box and off into the main aviary. The female remained inside. If I were to enter very quietly, with intent to see the bird actually depart the nest, I would see him suddenly appear at the entrance hole and then depart. On just two occasions I was able to see him actually roosting, eyes closed, in the cock's nest cavity. When taken apart, the chamber used by the male was unlined, that of the breeding chamber fully lined with tiny soft bents and fibres.

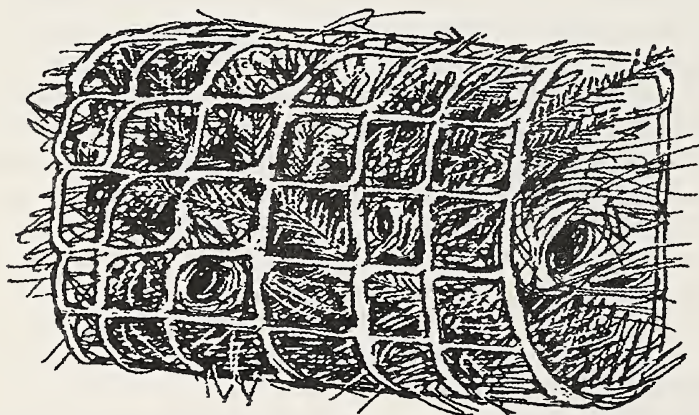
The second case was with a pair of Java Sparrows *L. oryzivora*, and also occurred in my establishment when I lived in London. The birds were in a complex that consisted of an indoor flight some two

metres cubed, with an outdoor garden flight about five metres long. Inside the house I had placed an artificial hollow log nest box, constructed from slabs of Spanish Oak bard, intended for a pair of Grosbeak Starlings *Scissirostrum dubium*. The starlings did take to the nest with obvious pleasure and some excited calling, and began carrying straws to it. The Java Sparrows decided to take over the box and managed to evict the starlings without much difficulty. There were other boxes available, including another log box of a horizontal design, but these were never taken seriously by either species. Subsequently I removed this nest and dismantled it. Inside, the Java Sparrows had built a double cavity nest. In design it was similar to that of the Timor Sparrows, only vertical. The main cavity below was fully lined, the upper one only rough straws and grasses. I do not know if this nest was used as a cock's nest. In the case of a munia using a box, it would be normal for the cavity to be filled with straws until a nest chamber could be constructed just within the entrance. The nature of the design in this instance suggests the double chamber was deliberate.



Drawing to show the structure of the cocks nests built, left, by a pair of Java Sparrows, and right, by a pair of Timor Sparrows.

A third case was with the Black-rumped Munia *L. leucogastroides* (Restall 1987). Five birds were kept in a large breeding cage 1.83 m long that contained a large flattened roll of garden fence plastic mesh that had been fixed to the rear wall of the cage. This had been loosely stuffed with straw. It is a wonderful device that I first saw in Mike Fidler's birdroom and had copied. The birds find it irresistible, and are guaranteed to build nests in it. One of the pairs built a nest at one end that quite definitely had two cavities, the first being unlined and apparently used by the male in a similar way to the male Timor sparrow as described above.



Sketch of the rolled and partly flattened plastic garden fencing stuffed with hay in which a pair of the author's Black-rumped Munias built a twin chambered nest.

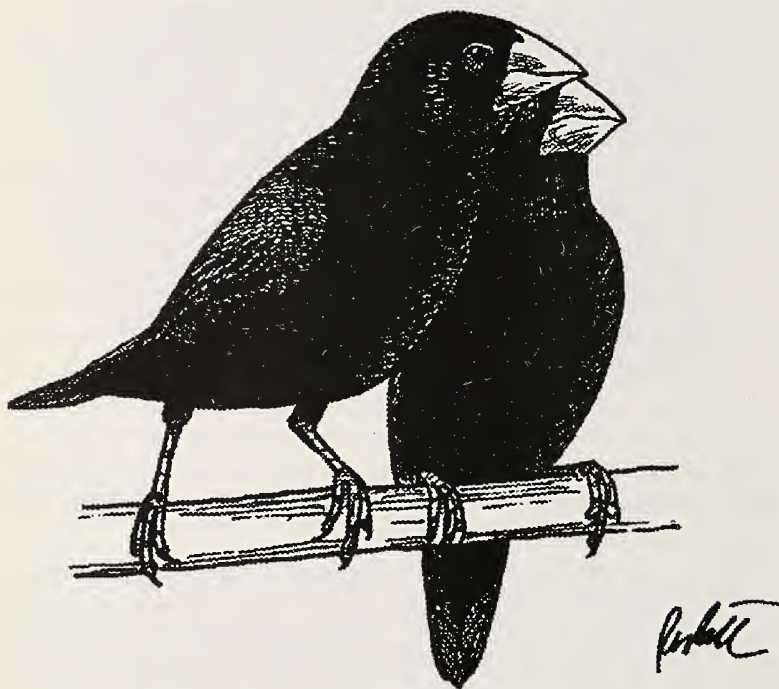
There are no records of analyses of *Lonchura* nests built in holes in trees or other cavities for it to be known whether this was the kind of aberrant behaviour of birds in captivity that does not occur under natural conditions. The only reference to possible cock's nest building in munias I have been able to find is in the Queensland Finch Society handbook (1987), in which it says of the Yellow-rumped Mannikin *L. flaviprymna*, "... The Yellow-rump nest is a domed structure built from coarse grasses on the outside, with the inner chamber lined with softer grass ... Sometimes a roost nest is built above or below the main nest". It is unclear whether this roost nest is part of the breeding nest structure or separate, but I suspect it means a roosting nest nearby.

Peering Enforced Singing.

The phenomenon of peering in munias is well known (e.g., Moynihan and Hall 1954, Morris, and others). Briefly, it occurs when a singing male unintentionally attracts the attention of other birds that stand very close to the singer and appear to peer at it. These peerers are almost invariably but not exclusively males and they are almost invariably but not exclusively conspecifics. There is usually only one peering bird, but sometimes there is one on each side of the singing bird, and occasionally a third or fourth will stand in line to await its opportunity. Many species of munias are known to peer, and it is probable that every species does. The birds in the genus *Lonchura* fall into two groups in terms of the distance they maintain between each bird when perched together. Those that clump, that is to say they perch so close to each other that the bodies actually touch, are known as contact species. Those that maintain a small space between each bird as they perch are known as spacial species. In general the *Munia* subgenus, which includes the Tri-coloured Munia *L. malacca*, the Great-billed Mannikin *L. grandis* and the Black Mannikin *L. stygia*, are spacial birds, although I have seen all of these clumping at some time or other. The *Uroloncha* subgenus, which includes the White-rumped Munia *L. striata* and the Scaly-breasted Munia *L. punctulata* are typical of contact species that will clump together. Contact species will peer very closely, the bill of the peering bird possibly even touching the bill of the singing bird. In spacial species the peering bird will keep a short distance from the performer and never actually touch it. Peering is not a phenomenon that occurs only in captivity, for I have seen it in both Chestnut Munias in Indonesia, and Scaly-breasted Munias in Sri Lanka.

With three species that I have studied in captivity, the Black-breasted Mannikin *L. teerinki*, the Great-billed Mannikin and the Hooded Mannikin *L. spectabilis*, I have observed on several occasions what can only be described as Peering Enforced Singing. What happens is that a male bird is sitting quietly, doing nothing in particular, when another male will fly up and perch alongside. The newcomer at once stretches and leans onto the unwitting bird and peers in an overbearing, seemingly threatening way. What distinguishes this from usual peering is the way the enforcer actually leans over the singer-to-be. The first bird may shift away slightly, appearing to be uncomfortable and - at the risk of being anthropomorphic a little embarrassed - at which the peerer moves up, continuing its overhearing importuning. Whether the first bird

shifts or not, it soon begins to sing. It sings in a mechanical way, without any body movements or apparent enthusiasm, and soon stops. The importuning peerer immediately and visibly relaxes its posture to that of normal peering. But when the singing bird stops, which it is likely to do sooner than when its performance is self-generated, the enforcer is very likely to repeat its efforts and persist until the victim sings again. Sometimes it will be forced to sing several times.

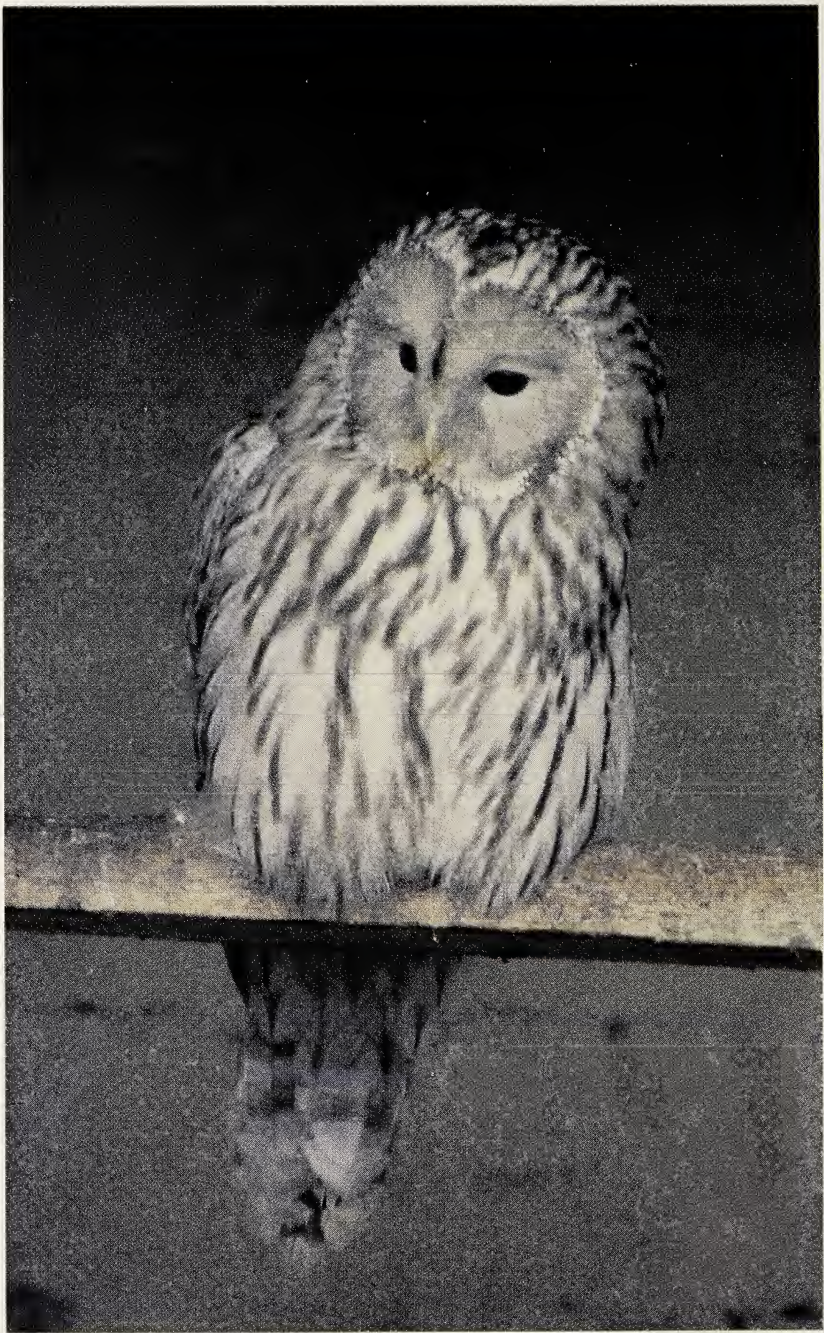


Great-billed Mannikin pressuring another bird to sing by an overbearing peering posture, actually placing its bill above that of the other bird.



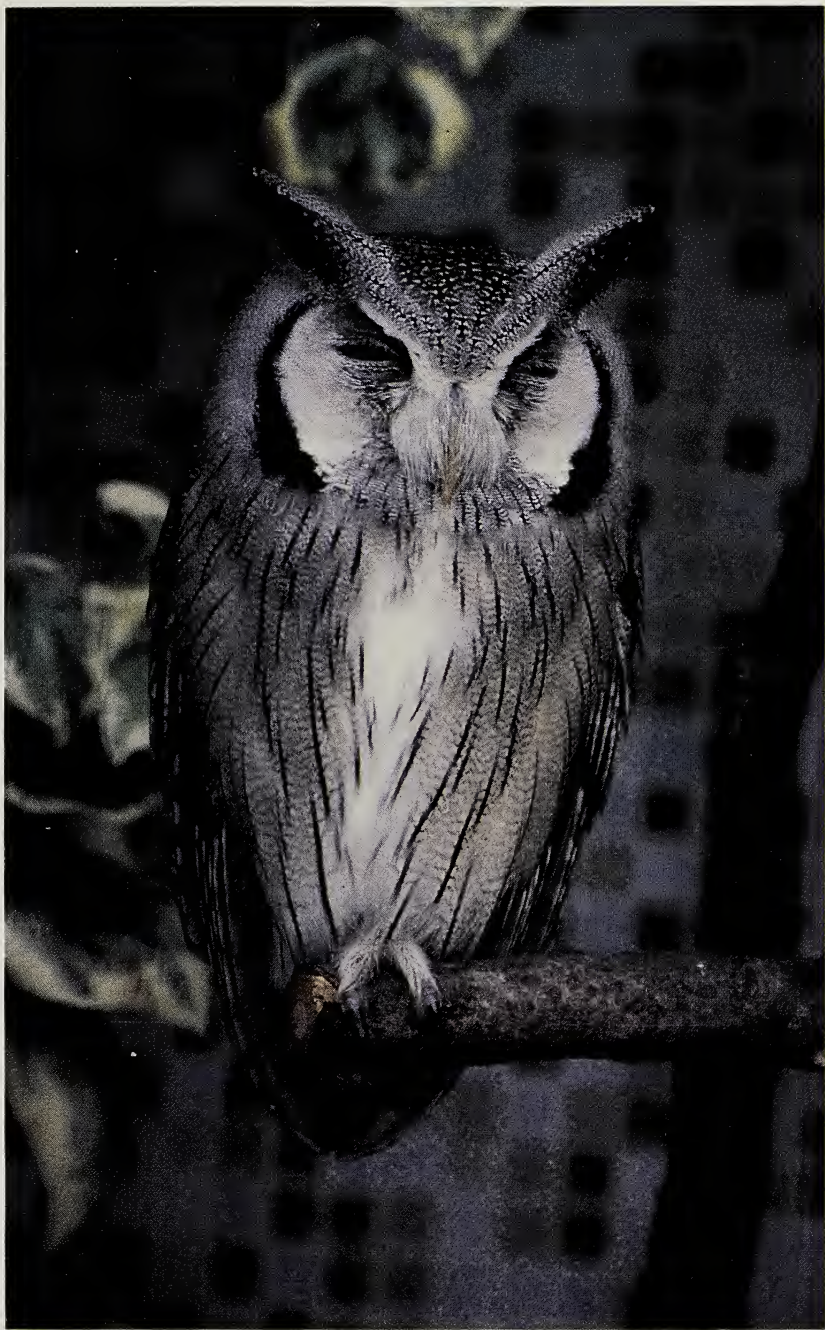
Dennis Avon

Stella's Lorikeet



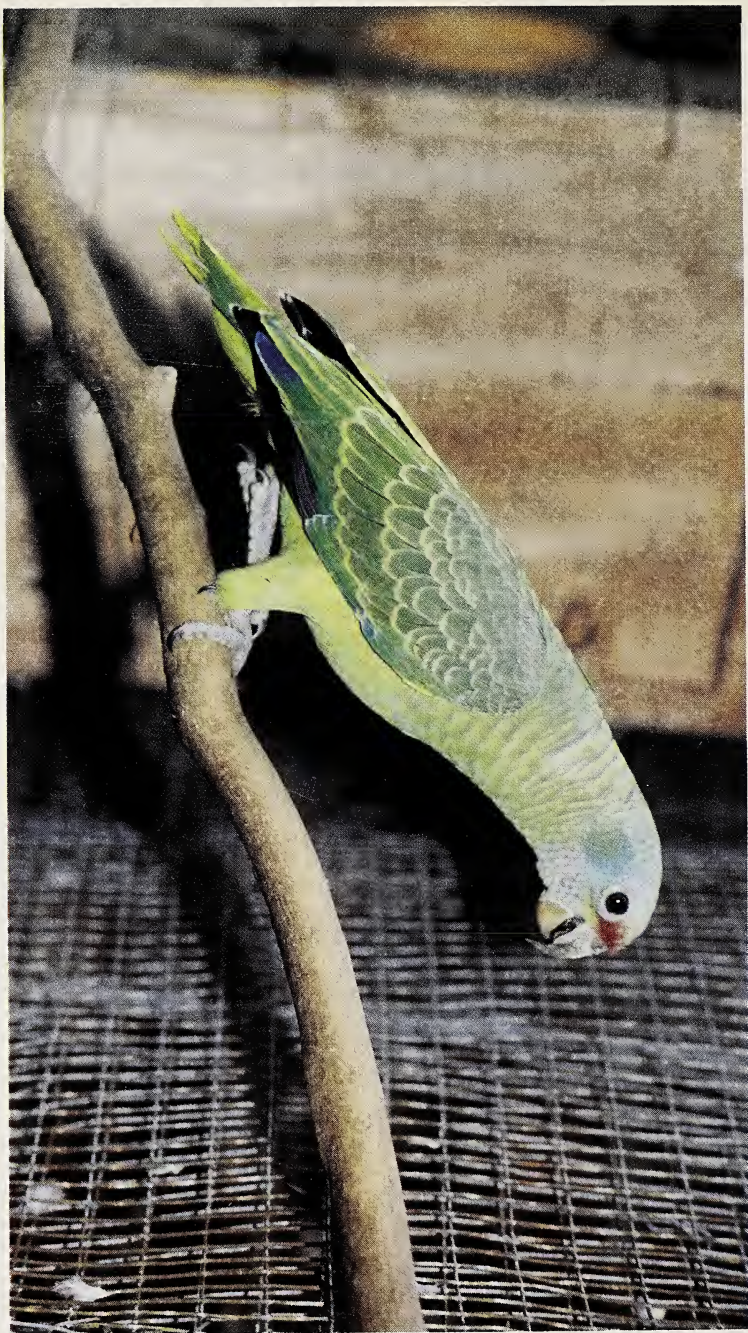
Zoological Society of London

Ural Owl



Zoological Society of London

White-faced Scops Owl



Juvenile Red-tailed Amazon

Dennis Avon

On one occasion a male Hooded Mannikin was perched alongside a female with which it appeared to be bonded. He sang a strong undirected song several times, and attracted three other males which took turns in peering. One of these peering males returned a few minutes after the episode had finished, and by enforcement peering induced the singer to perform a few more times. The unfortunate performer had been pushed up to the female, who in turn edged along the perch, until the pair were literally squashed against the bars of the cage. Throughout the entire episode the female ignored the proceedings, and remained clumped next to her mate.

Single-wipe feeding on grass seeds.

In an interesting paper of observations of mannikins in the field in Papua New Guinea, Baptista (1990) describes seeing a Great-billed Mannikin taking soft green grass seeds from a pannicle in one single wipe. The bird appeared to slipe or wipe its bill along the stem, gathering all the seeds in one go. There is a temptation to interpret this as an advantageous adaptation by the species, and explaining perhaps at least one reason for the disproportionately large bill. For some time I was able to keep nine Great-billed Mannikins in a large all-wire cage outside the dining room window. I did everything I could to encourage the birds to use the single wipe technique by providing seeding grasses of various kinds in a variety of ways. I never saw them use the single wipe.

Earlier this year I was staying at a hotel outside Manado, in northern Sulawesi, where I spent a lot of time watching the Chestnut Munias referred to earlier in these notes. On one occasion I saw one of these birds use the seed-wipe to pull several soft green seeds from the pannicle. The one bird did it twice and another bird used the single-wipe to take three or four seeds. The grass was short and was of the *Digitaria* group.

Sentry duty.

When watching Moluccan Munias *L. molucca* and Five-coloured Munias *L. quincolor* feeding in long grass in an area between the town and the river at Aileu in East Timor, I noted the occasional munia that did not drop into the grass to feed with the rest of the flock, but stayed near the tip of a tall stem, very obviously keeping watch. There were two obvious predators nearby, a kestrel, and the boys who had successfully collected a pile of munias' nests from within the grass. I did not note at the time which of the two munias was the sentry, but I am certain that on another occasion I did see a Moluccan Munia on watch. A week

later, on the island of Liran, I watched munias several different times. Typical, was when a flock of several dozen Scaly-breasted Munias *L. punctulata* were feeding in grass. There were sometimes, but not always, just a few Pallid Munias *L. pallida* feeding with them, and these took it in turns apparently posting sentry. It was not certain which birds would drop into the grass to feed and which would stay on a tall stem keeping lookout. It was certain that the Scaly-breasted Munias never bothered, and when the Pallid Munias flew off it became possible to approach the flock to within a few metres. At other times a small flock of Zebra Finches *Poephila guttata* would feed in the grass. They were not quite as alert as the Pallid Munias, but were nowhere near as casual as the Scaly-breasted Munias.

In northern Sulawesi I watched several species of munia, and found all of them feeding in a rice paddy on one occasion. This time it was definitely the Moluccan Munias that were on sentry duty. At first a few Moluccan Munias would remain on tall exposed stems, then one by one they would drop down, but there would always be one that stayed up. Sometimes a bird would come up and be sentry as well, but it was rare that a sentry would join the feeders. It is much more difficult to see the sentry duty behaviour in captivity, unless the birds are in a roomy flight with long grass. However, I have noticed that on occasions one bird in a high up cage would remain on a perch, apparently being sentry, while the other birds dropped out of (my) sight to forage on the cage floor. I have noticed this with Cream-bellied Munias *L. palliventer* (Restall 1995), Hooded Mannikins *L. spectabilis*, and Black-breasted Mannikins *L. teerinki*, but never with Chestnut Munias nor Scaly-breasted Munias. It may be that those species that lack any white in their plumage rely more on being cryptic to potential predators.

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THE MOUNTAIN PEACOCK PHEASANT AT BIRDWORLD

By Paul Wexler, (Farnham, Surrey)

The Mountain Peacock Pheasant *Polyplectron inopinatum* occurs naturally in the central mountainous forests of the Malay peninsula, '...it may be looked for in humid, dark ravines above three thousand feet' (Beebe, 1922).

Males and females of this species look very similar, the female being slightly smaller, - especially in the tail - and her colouration is a little duller. The overall appearance shows a dark grey head with delicate spots of white. The throat, breast and belly are a subtle shade of grey brown. It is the upper wing, back and tail covert colour that links this bird in the generalised group of 'Bronze-tails'. Throughout the shining bronze of the wings and along the graduated tail are 'eyes' of metallic green, it is these patches, especially when the males display, that give the appearance of Peacocks.

Four birds, two cocks and two hens were put on loan to Birdworld by the World Pheasant Association UK early in 1992. Initially, both pairs were placed in off-display aviaries to settle and indeed appeared to do so remarkably quickly. The first surprise came within a month of their arrival when a broken egg was found on the feeding platform. Sadly on this occasion a second egg, which makes the usual two-egg clutch, was not produced.

The diet originally given comprised of a commercial pheasant pellet ration to which mixed seeds such as millet and linseed were added, together with chopped greens, fruit, livefood and a sprinkling of vitamins. A high proportion of these additional foods was eliminated during the 1994 season, when the birds were given only a pheasant pellet ration with livefood in the form of mealworms; vitamins were still used to supplement the diet. The production of eggs continued and two further clutches, each of a single egg, were laid by the same hen at 15 and 23 day intervals respectively. The last egg in 1992 was laid on 1st July, It was in good condition and taken for incubation in our Incubation Research Station. Unfortunately the embryo died after only a few days.

Laying continued throughout 1993 and 1994, although there were a few hiccups that defeated production. However, on 23rd September 1993, after 15 eggs had previously failed, two chicks

were hatched. Unfortunately both died - one at 14 days, the second after 30 days.

At the beginning of 1994 the males were swapped and we lost the female which had produced the hatched eggs. Therefore, in March the remaining male was moved off-display from the Tropical House to make space for the other pair to be housed there.

Within a day of the birds being transferred an egg was laid - only the second egg from this particular hen since she had been with her new partner, although it was her 11th clutch since the beginning of 1993. Two days later a second egg was laid, but this one was broken when found. After a further 12 days another clutch of two eggs was laid

Neither the egg from the 11th clutch nor the first egg from the 12th managed to grow completely and it was not until 12th April that the first chick of 1994 hatched after an incubation period of 22 days. From the remaining seven clutches in 1994, a further 14 chicks were hatched.

Since April 1992 35 eggs have been laid. The average length has proved to be 49.5 mm, breadth 35.6 mm and weight 34.1 grams.

The first 1994 chick was treated very carefully, primarily because we anticipated problems with it proving to be quite delicate. On hatching, this particular bird weighed 22 grams from a whole egg weight at internal pip of 26.8 grams.

On hatching, the young bird's appearance shows a typical pheasant chick patterning along the back. Although the overall colour of the natal down was brown, lines of dark and light were noticeable. The legs were long as is the case with many of the other Peacock Pheasants, and greyish brown in colour. The eyes were black and the beak brown.

The chick was brooded at 35/36° C initially, this temperature being reduced as it aged.

On day 1, food offered to the chick was a moist mash made up of pheasant starter crumbs and Avi-plus softbill mix. A shallow pot of this mixture was left in the brooder all day and night. It was important to replace the food every two hours or so as it quickly dried, and also to prevent souring. Throughout the day, tweezer-held white mealworms were offered, as were finely chopped pieces of clover dipped in water, plus the starter mash.

Day 4 saw a three gram increase in weight as did day 6, at which time the temperature was held at 28° C. The diet was still the same with the addition of other green food like lettuce.

By day 23 the youngster weighed 62 grams and its diet was dry

crumb mix, plus millet, given freshly every morning. In addition, it was offered finely chopped fruits, minced ox heart, mealworms and chopped greens. Much of the food was now being taken without the help of tweezer offerings. A few mealworms were also dropped into the food from time to time to stimulate interest in it.

On day 29 all was still going well. The chick by this time was well feathered and feeding well. It was deemed time to transfer it once more to larger accommodation. A 2 ft. by 2 ft. cage was set up, with newspaper around the sides to prevent external activities from stressing the chick. Food and water dishes were placed in the cage as was a suspended heat lamp and twigs of fir trees to provide cover and perching.

On being moved the young Peacock Pheasant appeared quite content but unfortunately it died during the following night, possibly due to a combination of increased drafts causing a chill plus stress incurred by this and the move.

By this time - 10th May 1994 - two more chicks from the next clutch were already 11 and 13 days old. Until this time they had been treated in a similar fashion to the first chick, with the possible exception that we were not being as 'over careful' with them and as a consequence they were feeding independently much earlier. In addition to the dish of food given to these chicks, mealworms were dropped into the brooders regularly throughout each day; they were always taken.

The move from brooder to cage was tried again when this clutch was about one month old. This time it proved more successful.

By following this regime during 1994 11 chicks were reared to maturity - followed, so far, by a further four in 1995.

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CITES 1 PROTECTION FOR RED AND BLUE LORY

By Roger Sweeney (Loro Parque)

There can be little doubt that during the last four years the wild population of the Talaud Red and Blue Lory *Eos histrio talautensis* has declined alarmingly as a result of the sudden international trade that developed for the species as an avicultural bird. At the CITES meeting which took place at Fort Lauderdale at the end of 1994, it was decided that *Eos histrio* should be placed in Appendix 1 of CITES. It can now be hoped that this protection will stop further capture of wild birds, but the future survival of the species must be of great concern given the almost complete lack of information about its wild biology and the true status of the remaining wild population.

As an important first step towards ensuring the species' survival, it is planned that this year Dr. Frank Lambert, principle investigator for the Species Survival Commission of the IUCN, will undertake a field assessment of *Eos histrio* over several months on the islands of Sangi and Talaud. It is widely speculated that the nominate subspecies may now be extinct on Sangi.

The main aims of the field study will be to assess the size of the remaining wild population of *Eos histrio*, gather biological data which will help formulate a more accurate picture of the conservation needs of the species and investigate whether the international trade in wild birds has indeed been curtailed following placement of the species in Appendix 1 of CITES.

Two other important endemic birds occur on the island of Sangi, *Loriculus amabilis catamene*, a subspecies of the Moluccan Hanging Parrot *L. amabilis*, and *Aethopyga duyvenbodei*, the Elegant or Sangi Yellow-backed Sunbird. It is hoped the project will allow status and biological data to be collected also on these birds.

The Loro Parque Foundation will act as principle funder of this IUCN project by providing \$14,000 - which amounts to 50% of the total cost. Other funding is being provided by several smaller groups such as the Zoologische Gesellschaft für Arten- und Populationsschutz, the International Loricidae Society and the AZ organisation in Germany. Field work is planned to begin in 1995 and the results should be published in 1996.

There are small numbers of *Eos histrio talautensis* in Europe and the USA, and what are believed to be rather larger stocks in South

African and Asian aviculture. As a further step towards ensuring the future survival of the species, Loro Parque is preparing a petition to be presented at the next EEP conference, which this year takes place in Poznan (Poland), asking for the support of the Psittacine Taxon Advisory Group in backing Loro Parque in the establishment of a European regional studbook for *Eos histrio*. Given the support of this TAG, I hope to start compiling the studbook in the second half of 1995 and would welcome any enquiries from people keeping the species who are not already in touch with me.

I can be contacted at Loro Parque, S.A., Puerto de la Cruz, Tenerife.

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LONDON ZOO NOTES

By Simon Tonge

Although no new buildings have been opened at the zoo this year, refurbishment and upgrading of existing aviaries continues apace - particularly in and around the Bird House. At the same time we have continued to upgrade the collection, deleting those species that do not fit the zoo's Mission Statement and replacing them, where possible, with species that are both threatened in the wild and which will inspire commitment to the conservation of nature in our visitors. Thus we have recently added two pairs of Siamese Fireback Pheasants *Lophura diardi* and two pairs of Palawan Peacock Pheasants *Polyplectron emphanum*, while removing some of the commoner pheasant species from the collection. We have also imported a male Congo Peafowl *Afropavo congensis* from Antwerp Zoo to pair with our lone female.

The large Southern Aviary has been cleared of waterfowl which were causing considerable damage to the vegetation. The aviary has now been re-turfed and the zoo's flock of Abdim's Storks *Ciconia abdimii* has been transferred there. In addition, a small group of Little Egrets *Egretta garzetta*, recently imported from Emmen Zoo, and three Yellow-billed Storks *Mycteria ibis*, received from Bristol and Lisbon Zoos, have been placed in the aviary. It is hoped to develop small colonies of a number of stork and heron species as the aviary offers them both plenty of space and height, and a large variety of nesting places. We received a group of four 1994-hatched female Buff-necked Ibis *Theristicus caudatus* from Bristol Zoo. These have settled well and can be seen in the paddocks adjoining the Stork and Ostrich House.

Another growing collection at London Zoo is of *Ptilinopus* and *Ducula* pigeons over the last two years or so, and we have received single specimens of Zoe *Ducula zoeae*. Blue-tailed *D. concinna*, Pinon *D. pinon* and Purple-tailed Imperial Pigeons *D. rufigaster*. All these species are very rare in captivity in the UK and mates are currently being sought outside the country.

Finally, a pair of Red-tailed Black Cockatoos *Calyptorhynchus magnificus* have recently completed quarantine and are on exhibit in the new Macaw Aviary.

The zoo recently sent two female new Guinea Mountain Pigeons *Gymnophaps albertisii* to Vogelpark Walsrode in Germany. These

appear to have been the only birds of the species in the UK and, as the European stock is very small, Walsrode is attempting to establish them in captivity. The zoo's birds were a contribution to this effort.

With regard to the zoo's breeding programmes, 1995 has been a good 'owl year' to date. Five species were hatched including the usual Boobook *Ninox novaeseelandiae* and White-faced Scops Owls *Otus leucotis*, but pride of place must go to the three Spectacled Owls *Pulsatrix perspicillata* which were hand-reared during April. The zoo also hatched two Collared Scops Owls *O. bakkamoena* and a Ural Owl *Strix uralensis*, both species for the first time. Unfortunately the Ural did not survive, but Green Imperial Pigeons *D. aenea* and Black-backed Fruit Doves *Ptilinopus cincta* have hatched and reared chicks, while Black-footed Penguins *Spheniscus demersus* have been as productive as usual with 10 chicks reared to date.

A first for London Zoo was the fledging of a Silver-throated Tanager *Tangara icterocephala*. Black-cheeked Lovebirds *Agapornis nigrigensis*, donated last year by the Lovebird Society as part of a managed breeding programme for this endangered species, have fledged three chicks. Other species that bred last year, and have repeated their success in 1995, include Gough Island Moorhen *Gallinula comeri*, Fairy Lorikeet *Charmosyna pulchella* and Red-crowned Crane *Grus japonensis*.

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The Breeding of the Black-backed Fruit Dove *Ptilinopus cinctus* at London Zoo, reported in the *Avicultural Magazine* 1994: 189 - 191, is probably the first successful breeding in this country. Anyone who knows of a previous breeding in the U.K. is asked to inform the Hon. Secretary.

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COUNCIL MEETING

A Council Meeting was held on Sunday, 21st May, 1995 at Chestnut Lodge, Cobham (Surrey).

The following members were present:

Miss. R. Ezra (President)

G. R. Greed (Hon. Secretary/Treasurer) in the Chair

K. W. Dolton (Vice-President), R. C. J. Sawyer (Vice-President),

R. Grantham, N. Hewston, K. J. Lawrence, S. Pyper, J. Trollope and

Mrs. R. Wiseman.

THE SOCIETY'S MEDAL

The Society's Medal was awarded to:

P. S. Clear for breeding the Emerald Lorikeet *Neopsittacus pullicauda*.

K. W. Dolton for breeding the Yellow-naped Amazon *Amazona ocyrocephala auropalliata*.

B. Sayers for breeding the Bookook Owl *Ninox novaeseelandiae*.

P. Taplin for breeding the Siberian Robin *Erithacus cyanea*.

J. Trollope for breeding the Cinereous Finch *Piezorhina cinerea*.

Mrs. R. Wiseman for breeding Desmarest's 'Fig Parrot *Psittaculirostreis desmarestii*.

CERTIFICATE OF MERIT

This certificate is to be revised. In future it will be portrait style with an illustration of Rothschild's Mynah.

Certificates for 1st breedings are to be awarded as follows:

K. W. Dolton: Duvende's Lory *Chalcopsitta duivenbodei*

Bristol Zoo: Peruvian Stone-curlew *Burhinus superciliaris*

Chester Zoo: African Grey Hornbill *Tockus deckeni*

Chester Zoo: Ashy Starling *Cosmopsarus unicolor*

Chester Zoo: Trumpeter Hornbill *Bycanister bucinator*

Chester Zoo: Channel-billed Toucan *Ramphastos vitellinus*

Chester Zoo: Greater Vasa Parrot *Coracopsis vasa*

Chester Zoo: White-headed Buffalo Weaver *Dinemellia dinemelli*

Chester Zoo: Taveta Golden Weaver *Ploceus castaneiceps*

Chester Zoo: Pied Starling *Spreo bicolor*

Chester Zoo: Long-tailed Glossy Starling *Lamprotornis caudatus*

Tropical Bird Gardens (Rode): Greater Coucal *Centropus sinensis*

Tropical Bird Gardens (Rode): Golden-breasted Mynah *Mino anais*

Leeds Castle (Maidstone): Fischer's Touraco *Tauraco (corythaix) fischeri*

Leeds Castle (Maidstone): Von der Decken's Hornbill *Tockus deckeni*

Jersey Wildlife Preservation Trust: Mauritius Kestrel *Falco punctatus*

The Annual Accounts for 1994 indicated that the Society is in surplus, even after the additional costs generated by Centenary Year. The generosity of certain members, plus cost savings at Bristol Zoo have all helped.

Discussions took place about ways of improving membership, improving service and offering better value. Stuart Pyper will now act as Membership Secretary.

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VISIT TO BIRDWORLD

By Stewart Pyper (Frome, Somerset)

Members visited Birdworld, Farnham (Surrey) earlier this year. Although numbers were low, those who attended greatly enjoyed themselves on a fine, warm spring day. Birdworld continues to grow and the recently opened Heron Theatre is a big attraction.

There is plenty of space to walk and view the birds, and aviaries blend well against a background of trees and shrubs. The Penguin Pool always attracts crowds and the occasion of our visit was no exception.

The collection of birds is vast - Ostrich to Hornbills, Lories to Doves. Mountain Witch Doves once appeared in a number of UK collections but numbers have now declined. At Birdworld, however, we saw three pairs and an odd cock. One of the pairs was sitting.

Rob Harvey, who now runs Birdworld, explained that his birds will only sit indoors in a heated aviary - but to remain in tip-top condition they must have access to an outside flight.

Birdworld has excelled in the incubation and hand-rearing of all kinds of birds. We were allowed into the off-display rearing area where we saw Bronze-tailed Peacock Pheasants which are the subject of an article in this issue of the Avicultural Magazine. Last year the Yellow-fronted Woodpecker bred at Birdworld.

During lunch, Oliver Tynan of the National Council for Aviculture gave a short talk about the council's present work.

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NEWS AND VIEWS

DARTFORD'S NUMBERS INCREASE

The results of a survey of Dartford Warblers *Sylvia undata* in the UK show that there has been a four-fold increase in the population over the last 10 years. The survey, conducted by the Royal Society for the Protection of Birds, and English Nature, recorded a total of between 1,600 - 1,670 breeding territories in southern England.

As well as increasing in numbers, the species has spread, recolonising Berkshire, Cornwall and Devon, and breeding in Somerset for the first time. The main strongholds are Dorset with 650 pairs and Hampshire with about 600 pairs. They also breed in East and West Sussex, the Isle of Wight and Surrey.

Severe winters are one of the main factors which adversely affect the Dartford Warbler's population in the UK where it is at the most northerly edge of its range which extends across France, Spain, Portugal, Andorra, Italy and as far as North Africa. The Spanish population is decreasing due to a progressive decline in suitable habitat. It has been identified as one of the species most likely to benefit from global warming and climate change.

BTO News

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FLOCK PIGEONS FLOURISH

According to the diaries and journals of Australia's early explorers, the Flock Bronze-wing Pigeon *Phaps histrionica* was so numerous that flocks used to darken the sky over the arid interior of northern Australia each evening, as they flew to and from rivers and creeks to drink.

Yet during the late nineteenth century and the early part of this century, its numbers plummeted and there were some who Feared it may even have become extinct. Many of the early explorers survived by eating them, but hunting was not the main reason for this species' decline. That was due to the widespread introduction of cattle and the effect they had on its food supply, principally fallen grass seeds and herbs.

Fortunately, it managed to survive in the more remote parts of the country and - according to an article in GEO Australasia, Vol. 17, No. 1, and the evidence of the superb photos which illustrate it - it is flourishing again now in much of its former range. The bore holes and dams installed to provide water for cattle, mean that the pigeons no longer have to fly long distances to drink. Moreover, the

large amounts of dung which the cattle leave behind contain many undigested seeds which the pigeons eat.

Malcolm Ellis

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STORM WRECKS BRONX AVIARY

Earlier this year, one of the Bronx Zoo's 'landmark' exhibits, the Harry de Jur Aviary, collapsed under the weight of heavy snow. Constructed in 1899, the huge aviary was renovated in the early 1980s with the assistance of the Harry de Jur Foundation as a special facility for seabirds. Its habitat recreated the rugged terrain of Patagonia and a winding path through the aviary took visitors below a cliff with nesting tunnels for Inca Terns *Larosterna inca*, and past a rocky island inhabited by Guanay Cormorants *Phalacrocorax bougainvillei*, Andean Gulls *Larus serranus*, Grey Gulls *L. modestus* and Magellanic Penguins *Spheniscus magellanicus*.

Although no people or birds were injured in the accident, 33 of the exhibit's more than 100 seabirds either flew away or were blown by prevailing high winds. Although one Grey Gull and an Inca Tern were subsequently recovered, 31 birds remain missing.

With the help of the Harry de Jur Foundation and concerned area residents, the aviary will be rebuilt and the seabird colonies re-established as soon as possible.

Wildlife Conservation

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PICATHARTES SURVEY

In the latest Bulletin of the African Bird Club, Vol. 2, No. 1, Hazell Shokella Thompson and Roger Fotso, provide an excellent summary of what is known about the White-necked and Grey-necked Picathartes or Rockfowl *Picathartes gymnocephalus* and *P. oreas*, and include details of recent research, mainly in Sierra Leone and Cameroon.

The White-necked species was found in six of the seven forest reserves surveyed in Sierra Leone. Except for those in the Gola Forest, where 37 colonies with a total of 190 nests were found, the number of colonies in each forest was small and each contained only two nests.

The largest colony ever discovered, consisting of about 47 Grey-necked Picathartes' nests, of which at least 20 were believed to be occupied, was seen on a single cliff in the Dja Forest Reserve in Cameroon. Most colonies contain no more than five nests. This was unusually large, probably because of the scarcity of suitable

rock faces on which they could build their mud nests.

In addition, 91 breeding sites, occupied by an estimated 500 - 1,000 Grey-necked Picathartes, were discovered recently in south-eastern Nigeria. They are, their discoverer, J. S. Ash, believes, like other colonies throughout West Africa, seriously threatened by habit destruction and hunting pressure.

The article includes a colour plate, and Peter Wood and Peter J. Dolton, follow with a sort of twitcher's guide to where to see these two species in West Africa.

Malcolm Ellis

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RARE NEST FOUND

The first nest of the Crested Eagle *Morphnus guianensis* in an area north of Brazil - and only the second nest of the species ever recorded - has been discovered by biologists from the Peregrine Fund. The site was reported by a Guatemalan farmer familiar with the Fund's Maya Project, a study of birds of prey in Guatemala's rainforests.

Little is known about the species which lives in the dense tropical forests of Central and South America. It is similar in appearance to the Harpy Eagle *Harpia harpyja* but is somewhat smaller and its talons are not as long.

The greatest threat to this and many other birds of prey is slash-and-burn farming, in which farmers annually cut and burn the forest for planting. The farmers who occupy land surrounding the Crested Eagle nest, which was found outside Guatemala's Tikal National Park, are interested in the birds' welfare and have agreed not to conduct deforestation nearby.

Wildlife Conservation

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BREEDINGS AT BIRDPARK AVIFAUNA

At the start of any new breeding season we are aware that there will be both highlights and disappointments. Well, the highlights could be found in the successful hatching of a number of species including Victoria Crowned Pigeon *Goura victoria* (one), Ornate Lory *Trichoglossus ornatus* (one), Silver-beaked Tanager *Ramphocelus carbo* and Grosbeak Starling *Scissirostrum dubium*.

It was the first time ornate Lory and Victoria Crowned Pigeon had fledged in the collection. Among more common species which bred successfully are Azure-winged Magpie *Cyanopica cyana* (five),

Darwin's Rhea *Pterocnemia pennata* (10), Lilac-breasted Roller *Coracias caudata* (two) and Nyasa Lovebird *Agapornis lilianea* (four).

One of the disappointments was the death of the chick from our Southern Ground Hornbills *Bucorvus leadbeateri*. The egg was placed in an incubator and for this reason the chick had to be hand-reared. After hatching on 19th April it survived for 12 days. Although the youngster fed well its weight did not increase at an appropriate rate.

We have started an exchange agreement with a Chinese institution and expect to receive in the near future two pairs of Japanese Cranes *Grus japonensis* and two pairs of Oriental White Storks *Ciconia boyciana*.

A confiscated Wahlberg's Eagle *Aquila wahlbergi* has been sent to a collection in South Africa which has more birds of the species.

Hans van der Sluis

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ANTPITTA REDISCOVERED

Last seen more than 50 years ago, the Brown-breasted Antpitta *Graelaria milleri* has been rediscovered in the Ucumari Regional Park in the central Andes of Colombia where the species was last recorded in 1942.

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CONDOR REINTRODUCTIONS

The United States' Fish and Wildlife Service has identified two potential areas in the historical range of the California Condor *Gymnogyps californianus* for additional reintroductions; the Grand Canyon/Vermilion Cliffs region in Northern Arizona, which is mostly in federal or native American ownership; and the eastern foothills of the Gila National Forest, New Mexico. Environmental assessments are being prepared for the proposed release sites.

Endangered Species Technical Bulletin

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EYE ON THE MARSH

The Welsh television company S4C has sponsored the installation of a closed circuit TV system at the Wildfowl & Wetlands Trust's Llanelli Centre. A remotely controlled camera mounted on a hide overlooking the saltmarsh will relay to the main visitor centre the sights and sounds generated by large flocks of wild birds.

S4C are recording the year's most spectacular sights for a series of programmes about the Centre and the internationally important Burry Inlet for transmission in 1996.

Wildfowl & Wetlands

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THAI HAVEN FOR CRANES

Reports of crane chicks being captured in Cambodia and sold in Thailand, together with accounts from local people suggesting that the birds nest in scattered areas in the northern third of Cambodia, have led to the discovery of three Eastern Sarus Crane *Grus antigone sharpii* nests in marshes in north-eastern Cambodia.

The same aerial survey also revealed Giant Ibis *Thaumatibis gigantea* - rediscovered 110 km to the north in Laos in 1992 after an absence of 30 years. The scattered, isolated nature of the wetlands where the birds were located made them a safe haven for several species, allowing them to survive years of war.

International Crane Foundation Bugle

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THREAT TO STELLER'S EIDER

The globally threatened Steller's Eider *Polysticta stelleri* is one of a number of species of wintering waterfowl and seabirds threatened by construction of a large oil terminal at Butinge on Lithuania's Baltic coast. Ten species regularly occur there in internationally important numbers and conservationists have written to decision-makers in Lithuania recommending ways of reducing the impact of the terminal which is due for completion this year.

European IBA News

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BOOK REVIEWS

Published annually by the Zoological Society of London, the *International Zoo Yearbook* is required reading for people working in, or with a specific interest in, the world's leading collections. Volume 33 is likely to be of value also to many people in aviculture with a specific interest in aquatic birds, for in section 1 no fewer than 24 articles are devoted to families which have some association with aquatic habitats.

They include material about the Penguin Parade Exhibit at Jurong BirdPark; Management and Breeding of Pelicans in Captivity; Captive-breeding and Reintroduction Project for the Milky Stork at Zoo Negara; Hand-rearing and Breeding the Endangered Black-winged Stilt; Alcids in North American Zoos and Aquaria; The Wetland Aviary in Rheine Zoo; and Black Stork Management in Europe.

In Section 2 (New Developments in the Zoo World) are accounts of the first hand-rearing of Kakapo at the Auckland Zoological Park; Breeding Spix's Macaw at Loro Parque; and Reproductive Biology in King Vultures at the Paris Menagerie.

The Reference Section always provides interesting reading. Comprehensive details of mammals, birds, reptiles, amphibians and fish bred in collections around the world are provided for 1992, together with a Census of Rare Animals in Captivity (1993). Also here are details of international studbooks and registers for rare species of wild animals in captivity.

Among breeding achievements to take my eye (not necessarily 'firsts') were: Golden-headed Trogon (Houston), Malachite Kingfisher (Frankfurt), Black, and Malabar Pied Hornbills (Jurong Sing), Plate-billed Mountain Toucan (New Orleans), Swallow-tailed Manakin (Berlin), Barn Swallow (Wuppertal), Red-billed Oxpecker (Walsrode) and Twelve-wired Bird of Paradise (Rome CSCP).

In 1993, only two collections were recorded to have Blood Pheasants (Berlin and Bronx). Resplendent Quetzals were at Walsrode. Others of interest include Grey-necked Picathartes (Frankfurt) and White-necked Picathartes (Frankfurt and San Antonio).

A total of 14 species of Birds of Paradise (Paradise and Magnificent Riflebirds, Brown Sicklebill, Twelve-wired, Ribbon-tailed, Princess Stephanie's, Superb, Queen Carola's, King, Magnificent,

Count Raggi's, Lesser, Red and Blue BoP) were in a number of collections in various parts of the world.

The *International Zoo Yearbook* has 492 pages and is edited by P.J.S. Olney, Pat Ellis and Fiona A. Fisk.

The *International Zoo Yearbook* is available from the Zoological Society of London, Department IZY, Regent's Park, London, NW1 4RY.

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The Hornbills

Few aviculturists keep Hornbills, but the number is increasing, along with captive breeding successes. Only in recent years has it been possible to see representative collections of these striking birds, for example at Birdworld in Farnham, San Diego Zoo and Wild Animal Park and the outstanding collection at Jurong BirdPark in Singapore. They must have done much to increase interest in these handsome fruit-eating and omnivorous birds.

Alan Kemp's recently published book *The Hornbills* will have the same effect. The author (Head Curator in the Department of Birds at the Transvaal Museum) confesses to a 25-year addiction to hornbills. This addiction has resulted in a fascinating and well researched title. His knowledge is impressive and his style crisp yet interesting.

The chapters in the first part cover general aspects such as how and why the 54 species are designed, non-breeding behaviour, feeding ecology, breeding biology, and relationships and evolution. Some excellent tables summarise a number of interesting aspects. Hornbills, of course, are forest-dwelling birds, from Africa, Asia and Indonesia - areas which now contain the most damaged tropical evergreen forests in the world. In the chapter on conservation, the author points out that huge areas of forest are needed to support viable populations of the large species. An estimated minimum of 2,000 km² in Malaysia may be required to maintain a population of the Great Rhinoceros Hornbill, for example. Few, if any, of the current forest reserves in Africa or Asia seem capable, in isolation, of supporting a viable population of the larger Hornbills over the next century. A more manipulative approach to their conservation is indicated. The provision of artificial nest sites may become the most important method in moist evergreen forests.

The author suggests that for two species endemic to small islands, the Narcondam Wreathed and the Sumba Wreathed, cap-

tive breeding may be the only way to safeguard their extinction. On Sumba much of their habitat has already gone, Hornbills are offered for sale and even appear as items on the menu of local eating-houses. He also suggests that captive breeding in the country of origin would be useful in providing jobs and revenue for local people and to raise the value of Hornbills. He then makes a remark which I felt spoilt an otherwise superb book: "Exported birds might even be neutered, to prevent competition from birds bred in captivity outside the range of the species." This is totally illogical. No-one is going to breed the large Asiatic and Indonesian Hornbills in such large numbers that there would be no demand for those reared locally. Surely it is important to make an effort to breed from every single bird in captivity? And taking into account the expense of feeding and housing the large species, who would want to keep pairs which could never breed?

The second part of the book (nearly 200 pages) is devoted to species accounts. Each one contains a wealth of detail, such as estimated laying dates in the wild in different regions. There is a distribution map for each species. In the first part of the book excellent drawings by Martin Woodcock illustrate various aspects of behaviour. A section of colour plates in the centre depict every species, with charm and accuracy. In addition, there are two pages of plates depicting African Hornbills in flight.

The *Hornbills* (302 pages) is published by Oxford University Press and costs £40, (ISBN 0 19 857729 X). This monograph is required reading for anyone with an interest in these truly fascinating birds. It is the first title in the series Bird Families of the World. The next two will be on the Megapodes and the Penguins.

Rosemary Low

* * *



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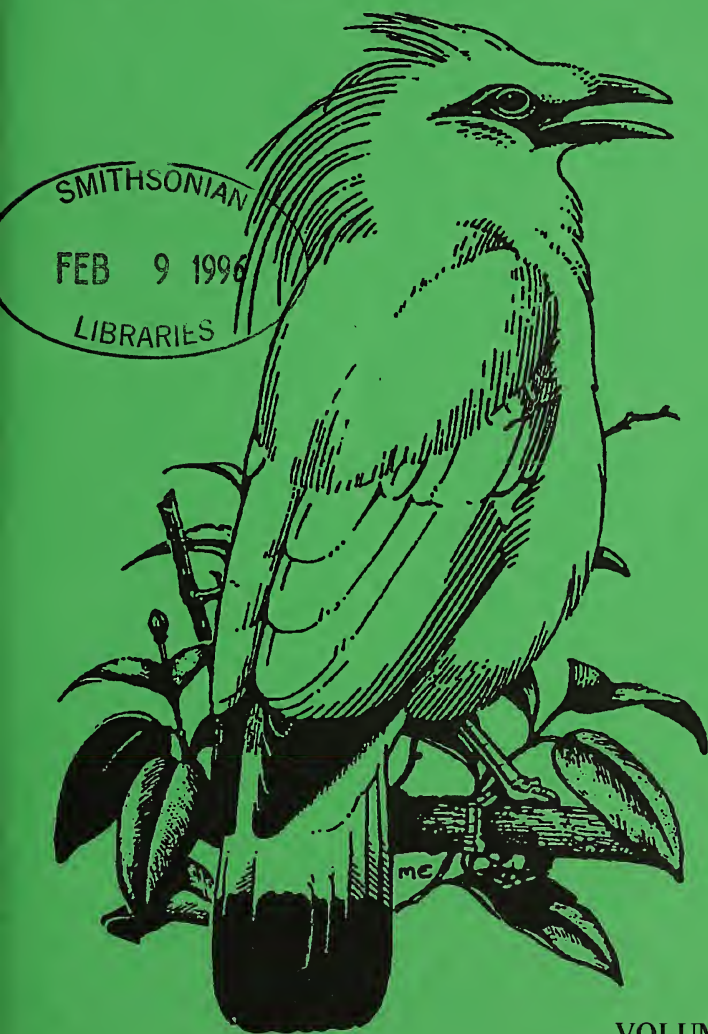
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AVICULTURAL MAGAZINE



VOLUME 101
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1995

THE AVICULTURAL SOCIETY

The Avicultural Society was founded in 1894 for the study of British and foreign birds in freedom and captivity. The Society is international in character, having members throughout the world.

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ADDRESS OF THE EDITOR

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EDITORIAL

At a meeting of Council on 3rd September 1995, the resignation of the Society's Chairman, Professor J. R. Hodges was accepted with considerable regret. Bob Hodges has been a member of the Avicultural Society since 1947 and was elected to Council some 20 years ago. Since then he has edited the Society's magazine with commitment and skill for some years. He was elected a Vice-President in 1991.

His interest in aviculture has been lifelong and he has clear recollections of acquiring his first Waxbills from Allen Silver's shop in Newport (Gwent). Later, Grass Parrakeets were a great interest and he has the distinction of having established the blue mutation of the Splendid Grass Parrakeet in Britain in 1975.

He has travelled widely, meeting fellow aviculturists in various countries around the world. His list of friends, some, sadly no longer with us, reads like an avicultural *Who's Who* and his recollections of them are invariably embellished either with interesting anecdotes or recollections of species which they had bred or with which they were closely associated.

Thus Alex Isenberg (California) is recalled for his successes with the strikingly handsome Collie's Magpie-Jay and Rosita's Bunting; Joseph Mattinson (Australia) is associated with breeding the rare Golden-shouldered Parrakeet; while Walther Langberg (Denmark) evokes memories of outstanding results with Parrot-Finches.

Among many other avicultural luminaries he knew well are Jean Delacour and Francis Rudkin. Alan Lendon is remembered with obvious affection as '... a great friend'.

He also recalls meeting some of the great collectors of the post-war era including Cecil Webb and Wilfred Frost - and in particular an occasion when the latter returned to England with a collection of Birds of Paradise only to find there were no buyers for them!

'Belonging to the Avicultural Society has given me a great deal of pleasure', says Bob. 'And through the Society, to be able to meet, over a near 50-year period, many of the most prominent aviculturists and collectors in the world has been a wonderful experience.

'Among the latter, although I never met Charles Cordier, at least I had the pleasure of seeing a magnificent collection of birds he brought from Costa Rica to the Bronx Zoo in New York and about which Jean Delacour subsequently wrote in the *Avicultural Magazine*'.

Bob, who is as enthusiastic about bird watching as meeting aviculturists, will combine the two interests in future overseas trips including another visit to Australia in 1996.

His resignation as Chairman takes effect from 31st December and he will be succeeded by another long-serving Council member, Ken Lawrence. I am sure all members would wish to be associated with the various expressions of thanks he has already received for his unstinting efforts on behalf of the Society over many years.

By coincidence, my own resignation as Honorary Editor of the *Avicultural Magazine* is effective following publication of this issue. I step aside with considerable regret for I have made many new friends over the past couple of years and have had a lot of help from various people. But I have found it increasingly difficult to deal as effectively as I would have liked with editorial matters since I live and work in the north of England and the magazine is produced in the west at Bristol.

As I write I am not aware who is to take over the editorial reins but I certainly wish the person concerned all success in a role which, although demanding, offers many a bonus.

F. W.

* * *

THE UMBRELLABIRD - A LITTLE KNOWN INHABITANT OF NEOTROPICAL FORESTS

By Rosemary Low

A varied collection of exotic birds can be seen at Palmitos Park, Gran Canaria, in the Canary islands. They include Birds of Paradise, Hornbills, Peacock Pheasants, Crowned Pigeons, Hummingbirds and, of course, many species of parrots. In fact, ten parrot species, numbering at least 200 birds, live at complete liberty. Brightly coloured parrots and toucans and little glittering Hummingbirds receive many admiring glances, but there is also a sombrely-coloured bird which most visitors pass without a second glance - if, indeed, they see him at all. Many people, however, spend several minutes in front of the adjoining aviary which contains a Dumonti's Mynah *Mino dumontii* - because it talks.

They are missing one of the most intriguing birds in the park - the Long-wattled Umbrellabird. It is a little-known member of the Cotinga family - fruit eaters of the neotropics, most of which are brightly coloured. What Umbrellabirds lack in vivid hues, is compensated by the uniqueness of the male's appearance.

Taxonomists vary in their approach to Umbrellabirds, which are considered either as three species, or one species with three forms. The Ornate *Cephalopterus ornatus* has a wide distribution over tropical northern parts of South America, the Bare-necked *C. glabricollis* occurs on the Caribbean slope of Costa Rica and in western Panama, and the Long-wattled *C. penduliger* is from the Andes of south-western Colombia and western Ecuador. There it inhabits montane forests from about 700m up to 1,800m.

Male Umbrellabirds are about 18in (47cm) long with black plumage and a crest which is perhaps more like a Beatle hair-cut of the 1960s than an umbrella. The "fringe" reaches just above the beak and just above the eyes. The tail is short. The female is about 15in (38cm) in length, brownish-black below with a smaller crest. The male has what is described as a wattle or a lappet which hangs from the neck over the breast. In the Bare-necked the wattle is short and narrow but the throat and neck are bare. The vivid scarlet colour is apparent when the air sac is inflated to give the appearance of a red balloon. Then the male makes a booming sound. According to Charles Cordier (in Ridgely, 1976), males chase each other with chuckling sounds and a throaty *oooh*.

In the Long-wattled Umbrellabird, the wattle is one of the most spectacular adornments of any bird species. It hangs from the upper breast to just below the legs. However, when the air sacs are inflated, the length increases so that there is an equal length below the feet and above. Furthermore, the appearance of the wattle changes dramatically; the feathers stand out at right angles and are widely-spaced, instead of forming a sleek, narrow appendage. I can only describe the expanded wattle as looking something like a black hyacinth.



Rosemary Low

It is a male of the Long-wattled species which we keep at Palmitos Park. His display is mesmerising! Fortunately, like Birds of Paradise and other species which have a bizarre display to attract females, he seems ready to perform to any admirer. He starts off by bouncing on the perch with legs firmly anchored in one position, and stretches to his full height. He bows his head, opening his crest

so that it looks something like a pom-pom. As he bows forward he ruffles the feathers of the elongated wattle so that they separate. He inflates his throat and starts to *vroom*. The resonant, low-pitched, drawn-out *vroom*, *vroom* is far-carrying. The large inflated air sac at the throat can be clearly seen on the downward bow. This performance will be kept up for several minutes and is usually carried out near the front of the aviary where he spends most of his time. He can see the two mynahs next door and, because they are black, I suspect that he might be displaying to them.

Displaying males in the wild are said to often perch lower than the high trees they normally inhabit; nevertheless, observing them must usually be difficult. Not surprisingly, little has been written about these extraordinary birds. One of the earliest references is that by Henry Bates, the famed British explorer, whose book *The Naturalist on the River Amazons* was a best-seller of its time. His adventures on the Amazon spanned the years 1848 to 1859. He recorded the pleasure of seeing an Umbrellabird for the first time, and described it thus: "... a species which resembles in size, colour and appearance our common crow, but is decorated with a crest of long curved, hairy feathers having long bare quills which, when raised, spread themselves out in the form of a fringed sunshade over the head. A strange ornament, like a pelerine, is also suspended from the neck, formed by a thick pad of glossy steel-blue feathers, which grow on a long fleshy lobe or excrescence..." (Bates, 1863).

Bates must have seen the Ornate Umbrellabird which, he stated, was confined to the forests of the plains of the upper Amazon. He described it as a shy, retiring bird which lived in the highest branches and fed mainly on fruit. Its nest was constructed of small branches and placed in the top of a tall tree; the eggs were white and numbered two. Considering how few naturalists could have seen this species in this era, it is surprising how much was known about it. Presumably, much of the information was gleaned from natives. The native name for it, *Uirá mimbéu*, referred to its voice. Undoubtedly they heard it more often than they saw it.

Bates was familiar with it though, and described the male in flight, with the crest depressed and the wattle placed close to the body. The female has only the rudiments of the crest and wattle.

About 70 years after Bates, the British collector Walter Goodfellow, who took live birds to England for wealthy aviculturists, lived for four years in Bolivia. He left there in the early 1920s. During that period he had not been collecting birds for a living. Nevertheless, he had always wanted an Umbrellabird. It is the

Ornate which occurs in that region. He let it be known that he was seeking live specimens, as they were not rare in the area. On one occasion, a man (who must surely have been impatiently observing a nest) brought him a newly hatched chick. It was "covered in long silky down, bright gold in colour and like floss silk." He told the man to take it straight back to the nest.

On another occasion, when he called at a shack, he found "a brown bird there undoubtedly belonging to the species" which had been hand-reared. It was then that he discovered that he immature plumage was brown. He only saw one other captive specimen - a male with a broken wing kept as a pet on a farm. It fed on cockroaches.

The people in the area were delighted if they could adorn their hats with the crest of the Umbrellabird. Sadly, one man had nine or ten in his hat.

While making that classic natural history film "The flight of the Condor" in the 1970s, Michael Andrews encountered an Ornate Umbrellabird at the Coca Falls in Peru. "There we were lucky to get a shot - albeit in swirling mist - of an umbrella bird displaying its extraordinary black crest like an extravagant plume on a helmet, and inflating its huge dangling feather-covered wattle. This is perhaps the first time that it had been filmed." (Andrews, 1982).

Umbrellabirds feed on fruits and large insects, perhaps also small lizards. Walter Goodfellow stated that he had seen them eating palm fruits, the size and shape of a large green date, which was swallowed whole. As one tends to think of them as preferring fleshy fruits, it would have been interesting to know if he made this observation during the breeding season. Palm fruits have a very high oil content but are usually very fibrous and, one would have thought, difficult to digest.

Our male at Palmitos Park feeds mainly on finely chopped fruits, including papaya, orange and pear, also seedless grapes. He receives daily a small amount of minced beef heart.

Umbrellabirds have always been rare in zoological collections and probably virtually non-existent in private collections. When visiting San Diego Zoo in California in 1992, I was delighted to see a pair of Long-wattled there. In the past, Umbrellabirds were also exhibited at Los Angeles Zoo. However, King (1981) states that it is "avidly hunted for the cage-bird trade". This seems rather unlikely. Colombia has not permitted the export of birds for 30 years or so and in view of the difficulty of even locating this canopy-dwelling species, the number which have ever been cap-

tured alive must be rather small. Also, there is no demand for it.

King also states that it is large enough to be shot for food and that it is one of the first species to disappear when new areas of primary forest are opened up. It is apparently a naturally rare species, even in suitable and remote habitat, a considerable amount of which still survived a decade or more ago. It does occur in the Archicaya valley in the Valle department of Colombia, where the watershed is protected for the purpose of hydro-electric development.

The Ornate Umbrellabird has a wide range but is not commonly found in upland forests, preferring flooded forest and riverine islands. One might have thought that this type of habitat would afford it more protection but Goulding (1989) points out a particular threat. Since the advent of commercialized rubber collecting, which has traditionally been concentrated on floodplains and riverine islands, Umbrellabird populations have probably diminished as the victims of hunting. They can be seen most easily when they cross a river in search of fruiting trees. Goulding mentioned that Alfred Russel Wallace, the great nineteenth-century naturalist, described Umbrellabirds as "tolerably abundant" in the Central Amazon region near Manaus. This is no longer the case.

In Central America, the Bare-necked species is uncommon and local in its distribution, or rare. It breeds in the wetter parts of the cool subtropical belt of the Caribbean slope; out of the breeding season, that is from about July to December, it migrates to the foothills. There unfortunately, it, too, is threatened by deforestation.

Umbrellabirds are unique, intriguing and little-known inhabitants of neotropical forests. A way must be found to preserve large enough tracts of forest, especially in remote areas, to ensure their survival and that of the multitude of other life forms which share their environment.

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JEAN DELACOUR AND *THE AVICULTURAL* *MAGAZINE*

PART IV: 1970 - 1982

By Joseph H. Lindholm, III
(Keeper II/Birds, Fort Worth Zoological Park)

At the Conclusion to this autobiography, *The Living Air*, Jean Delacour (1966) wrote: "It becomes difficult to face the future. One has the uneasy feeling of being anachronistic. The end lurks around the corner, and it must be met gracefully, but I pray that it comes before my interest in life has been dulled, or even suppressed by illness and infirmity. Until then I shall delight in all that is beautiful, exciting or simply funny in the world, and I am resigned to departing at any time, without regret ..." He was then 76.

'The summer of 1969 has been one of the best I can remember, as far as the weather goes, in Western Europe. But it has not been a good breeding season for birds. The spring was dull and cold and the number of clear eggs high. Certain species even did not lay at all...

'A large number of young birds ... however were reared at Clères ... including Ringed Teal and another brood of five Black Brants. But there were only six Emperor Geese, while none of Red-breasted or Ross laid at all. By luck, the only hybrid produced was from a male Black Brant and a female Lesser Whitefront (an almost entirely black bird). A brood of Ruddy Ducks did not survive, the six chicks having been carried away by the flow of the running water. We now have two pairs of Trumpeter Swans, sent by the United States Government.

'The Tasmanian Water Hens raised 18 young, six under a bantam hen. All the others were reared in the park by two pairs...

'A number of new birds were acquired during the last season: pairs of West African Ostriches, Two-wattled Cassowaries and Wattled Cranes, ... Ijima Copper Pheasants (a gift from Mr. Ed. Fitzsimmons), White-headed and Ross Touracous, also a number of small tropical birds for the new accommodations which have been built during the last summer; a modern bird gallery in what used to be the drawing-room of the chateau (50ft. x 25ft.), destroyed by fire in 1939 ...

'The collection ... is varied. There are only one, two or three

birds in each of the smaller cages, while the four flights can accommodate up to 70. They consist of Hummingbirds, Sunbirds, Sugarbirds (including *Dacnis lineata* and an *Iridophanes pulcherrima*), Mexican Golden-browed Tanagers *Chlorophonia callophrys*, all the species of American Painted Buntings *Passerina*, Red-breasted Parrot Finches, a pair of small Red-headed Barbets *Eubucco bourcieri*, a Cock of the Rock, a Blue and White Indian Flycatcher and several Toucanets. The two larger aviaries contain big Tanagers (Scarlet, Black-throated, Mountain, Red-rumped and White-winged Blue), Blue and White Kingfishers, Pittas (Irena's and large-billed), Bellbirds, Amethyst Starlings, Bulbuls and Leafbirds, Rosita's Buntings, Black-headed Sugarbirds, Roulrouls, Silver Chinese Quails, Sand Grouse and a few Waxbills. The two smaller ones are the home of Calliste Tanagers (10 species), Sugarbirds and Sunbirds.

'Larger aviaries in adjoining halls are inhabited by several species of Toucans, including the Mountain Blue *Andigena laminirostris*, Barbets, Troupials, Weavers, Whydahs and Starlings.

'Some of those birds came from the collection of the late Mrs. Milton Erlanger, as are five Knysna Touracous, all reared in her aviaries at Elberon, New Jersey, during the past few years. They were presented to me by her family and they constitute a living memorial to a great bird-lover and a perfect friend ... '

(The birds at Clères in 1969. January-February, 1970 Vol. LXXVI, 24 - 25).

'Once again I had the pleasure of visiting Brazil in November 1969, spending a couple of weeks with my friend Dr. E. P. Béraut near Rio de Janeiro. His collection of tropical birds and plants ... looks like a huge conservatory...

'Although there are 25 aviaries, large and small, and more in the making, none can be seen when you walk through the grounds. All are built along the outer fences, sheltered by walls and hidden by shrubbery...

'Three of the flights are of large size and full of trees and plants. They are close together, but irregular in shape. A corridor divides two of them and gives access to a bird kitchen and to shelters where caged birds and hand-fed fledglings are kept. Nine compartments run along the back of the third aviary, and plans are made for making another dozen of those breeding accommodations, where pairs of birds are secluded. At present, they consist of several pairs of Eclectus Parrots, most of them reared there, some Toucanets,

Motmots, Tacazze Sunbirds, Garnet-throated Hummingbirds, Blue and Golden-breasted Sugarbirds, Fairy Bluebirds, the latter with young. When pairs of birds are showing signs of nesting in the larger aviaries, they are quickly removed to the privacy of these breeding pens. The corridor is the home of a few pets - a Razorbill Currassow, a Sun Bittern and a Purple-capped Lory.

'The three large flights contain remarkable species of soft-billed Passerine birds, exotic as well as South American, of which it no doubt is the best collection existing to-day.

'The first one is inhabited by a pair of Umbrella Birds *Cephalopterus penduliger*, and three male and two female Guianan Cock of the Rock *Rupicola rupicola*. They are all tame and agree perfectly well. The male Cocks of the Rock display together. A Lesser Bird of Paradise has been there for eight years and is in superb plumage. A pair of Blue-winged Pittas and a Brazilian Ant-Pitta *Grallaria varia* also live in peace as well as a few smaller birds: Golden-winged Sunbirds, a Waterton's Wood-Nymph, and a few small Formicariidae, including the lovely *Pithys albifrons*, ... with a crested white face of the most unusual appearance. I have seen long ago these curious birds following army ants in French Guiana whence Charles Cordier brought some to Clères later on.

'Another large flight is the home of Central American and Golden-headed Quetzals, Scarlet Cocks of the Rock, a number of Cotingas: a lovely and tame Swallow-tailed *Phibalura flaviventria*, a Bare-necked Fruitcrow *Gymnoderus foetidus* and a Black-necked Tityra *T. cayana*; a Swallow-winged Puffbird *Chelidoptera tenebrosa*, various Tanagers, Scarlet-chested Sunbirds; several small Hummingbirds *Sericotes holosericeus*, *Augastes lumachellus*, *Stephanoxis lalandei*; White-capped Redstarts *Chimarrhornis*, Royal, Splendid, Amethyst Starlings, American Jacanas (nesting), different Plovers, etc.

'The largest aviary (about 35ft. x 25ft.), heavily planted, has a little winding river where Cotton Teal can swim; there are also Roul-Rouls and small Rails *Laterallus leucopyrrhus*; but is otherwise dedicated to small species. There are Sunbirds *N. pulchella*, Hummingbirds of several sorts, Paradise Tanagers, different Sugarbirds, Flowerpeckers *Dicaeum*, African Paradise Flycatchers, a few Old World Robins, and Blue Cotingas. But most remarkable is the collection of Manakins, which live there in perfect condition and never quarrel: *Pipra fascicauda*, *P. erythrocephala*, *P. rubrocapilla*, *P. pipra*, *P. serina*, *Manacus manacus*, *Chiroxiphia linearis*, *C. caudata*, *C. pareola*, *Elicura*

militaris, *Machaeropterus pyrocephalus*, and the magnificent *Antilophia galeata*, a fairly large manakin from the interior of Brazil (I found it common in Goias), black, with scarlet helmeted head and back.

‘There are other groups of aviaries. Two good-sized ones contain pairs of African Pigmy Kingfishers, Irena’s Pittas, Jamaican Long-tailed Hummingbirds, Blue-and-White Indian Flycatchers and a few others. Five more are inhabited by Ross and White-headed Touracous, Short-tailed Ant-thrushes *Chamaza*, Gnateaters *Conophaga*, several species of small Rails, Roulrouls, etc. There are pairs of Leadbeater’s Cockatoos and Queen of Bavaria’s Conures in a large flight. The Conures were laying in a log, but it is interesting to note that the Cockatoos, although in perfect condition, have not nested, probably due to the lack of a cold enough winter and of too much humidity. Elsewhere live several Toucanets *Aulacorhynchus sulcatus*, *Pteroglossus beauharnaiesi*, *P. bitorquatus*, a number of Hummingbirds, Sunbirds, and various small insect and fruit eaters.

‘At the time of my visit, many nestlings collected very young in Dr. Béraut’s extensive land holdings at Tapirapuan, Mato Grosso, were being hand-raised. The most interesting ones were 16 Trogons of four species *T. strigilatus*, *melanurus*, *curucui*, *collaris*; Cotingas, Puff birds, Swallow Tanagers *Tersina* and 17 Jacamars *Galbula ruficauda*. These were in broods of three or four. Very small when I arrived, they grew up rapidly and were flying and perching within 10 or 12 days. Absurdly tame, they were fed every hour on small, soft pellets composed of one-third ground beef heart, one-third grated carrots, one-third maize cake (cooked). These highly insectivorous birds are perfectly raised on that diet, which they continue to eat when grown up. They live so well on it that they have attempted to nest, digging in an artificial bank. But they are quarrelsome birds, and the female injured the male. Adult-caught Jacamars always refuse any food but live mealworms and never lived long; Dr. Béraut hardly gives any to his Jacamars, mealworms being scarce in Brazil. There was also an excellent young Squirrel Cuckoo *Piaya cayana* and a Nightjar, fed the same way as were the young Trogons.

‘Because of various difficulties in procuring certain foods, all birds in Dr. Béraut’s aviaries receive that same meat-carrot-maize-bread mixture, with diced cheese and for fruit, cut-up tomato and papaya, and occasionally grapes; practically nothing else. They all remain in perfect health as well as in excellent plumage and

colours; all the red tones are perfectly preserved by the carotenes contained in tomatoes and carrots.'

(Brazilian Bird Collections. March - April 1970 Vol. LXXVI, 71 - 75)

'Mr. Fitzsimmons has gathered a magnificent collection of Pheasants at Livermore in Northern California. It is supervised by Mr. Vern Denton, who owns the ranch on which the numerous and very well built aviaries stand.

'Rare species only are kept there, with the exception of pure, recently imported stock of Golden and Amherst's Pheasants. Many Ocellated Turkeys, different Junglefowls, Mikados and Ijima's have been reared, for example. There are several pairs of many desirable birds, including Malay, Bornean Argus, arrived lately, and a most remarkable collection of Peacock-Pheasants: all the species are represented including a pair of Rothschild's *P. inopinatum* and 1 - 3 Bornean *P. m. schleiermacheri*, both extremely rare, and never before seen in captivity. The Rothschild's have reared one young bird this year ...'

(Mr. Ed Fitzsimmon's collection of Pheasants. January - February, 1971. Vol. LXXVII, 23.)

'... A few other birds, some rather interesting, have also been reared: ... Collared Barbet, 1; Superb Spree, 3; Pagoda Starling, 2; White-winged Blue Tanager *Thraupis episcopus coelestes*, 4; Golden Tanager *Tanagara arthus aurulenta*, 1; Green Cardinal, 1.

'Dr. P. Ciarpaglini will later on publish here accounts of the most interesting cases.'

'Among the interesting novelties acquired in 1970, are a ... pair of African Trogons *Apaloderma narina* [which] are doing well, eating fruit and vegetables as well as insectile food, cake, meat and meal-worms. I had never before seen them in captivity. Kori Bustards have proved a problem, as they will eat any egg or small bird they come across, and they cannot be kept free in the park as I had hoped ...'

(Birds at Clères in 1970. January - February, 1971. Vol. LXXVII, 31 - 23.)

'... Our Black Brants were unsuccessful. We kept the last three years' offspring, over twenty birds, and they proved much less colonial in their nesting habits than we expected; they fought bitterly, three birds being killed, and even the parent pair failed to breed... The old female Australian Radjah, over twenty-five years old, died after laying two clutches of clear eggs; we now possess

only one pair of that subspecies, probably the last one in captivity ...

(The 1971 Season at Clères. January- February, 1972. Vol. LXXVIII, 24 - 45.)

'It has long been my contention that the various birds considered as members of the Sugar-bird family *Coerebidae* with the exception of those of the genus *Coereba*, really are Tanagers *Thraupidae* ... My belief in their very close relationship as members of the same family ... has just been highly supported by the recent production of hybrids between two species ...

'During 1971, several broods have been reared at San Diego Zoo from a pair consisting of a male Yellow-winged Sugar-bird *Cyanerpes cyaneus* and a female Mrs. Wilson's Tanager *Tangara nigrocincta fanny* ...

'The hybrids are intermediate and generally resemble Sugar-birds of the genus *Dacnis*. The males are a light blue with a white belly; the females resemble them but show much grey on the head and neck.

'It is interesting to note that there are many other Sugar-birds and Tanagers in the large planted aviary, through which visitors walk continually in the day. It is therefore not because of a lack of more appropriate mates that those birds have paired up and bred together ...'

(Sugar-bird Tanager Hybrids. March-April, 1972. Vol. LXXVIII, 48.)

'In these days of astonishing and disorderly proliferation of zoos and bird parks throughout the world, it is a rare pleasure to discover a really good one. But it is just what has happened to me and to my friends, Mr. and Mrs. Paul Jourde, when we stopped at the small town of Villars-les-Dombes on the 5th June, 1971.

'It is not that this new bird park was unknown to me. Three or four years ago, I received at Clères a group of leaders of the Department (County) de l'Ain, which is situated in the East of France ...

'... Dr. Ciarpaglini and I, also in Paris Prof. J. Nouvel, Director of the zoos, and his assistants, tried to help them in all possible ways in the planning of their park. A great deal of skill time and money was spent on the project and the bird park was opened on 18th July 1970. But one never knows, and previous disillusion in different countries, when I had seen for the first time the results of well intended good advice, have made me suspicious. My wariness, this time, proved quite unnecessary. The Parc Ornithologique

de la Dombes is a success, and no doubt one of the best of its kind in the world.

'It consists mainly of a long lake (Etang Grand Turlet) with smaller ones at both ends. The landscape is typical of a marsh, with comparatively few trees, mostly poplars and willows. Many others, however have been planted and are growing well. All around the lake is a walk, and at the sides, away from the lake, are groups of aviaries and enclosures... Near the entrance is an excellent bird-house...

'... Good breeding results were already achieved in 1970...

'... In addition... 25 local breeding birds were hand-reared: Long-eared, Brown and Little Owls, Black Kite, Kestrel, Montagu's Harrier, Purple Heron, Night Heron, Little Tern, Grey Wagtail and Oriole.

'... On the north side of the lake, between the shore and two long islands, some twenty pens have been built to house the pairs of swans and geese which have to be isolated. Some Crested Grebes are also to be seen here...'

(The Ornithological Park in the Department of la Dombes, France. May - June, 1972. Vol. LXXVIII, 96 - 99.)

'... Some 20 specially built aviaries are inhabited by Cockatoos (including Leadbeater's), Macaws (Lear's, Ambiguous), Amazons and other Parrots ...

'Seven species of Touracos live at Clères but only one, Knysna, have bred successfully this year, two pairs producing six young, three of which reached maturity. A regrettable accident took place after two young, just out of the nest, were removed when the male, evidently disturbed, killed the female.

'Three Kookaburras were hand-reared, the eggs being removed and hatched in an incubator, as the parent birds have developed the habit of devouring the chicks as soon as they are out of the shell.

'... two Baltimore Orioles were raised in the aviaries, ... probably for the first time in Europe. We also hand-reared five Fairy Bluebirds, three Orange-headed Ground Thrushes and one Fulvous-fronted Parrotbill *Paradoxornis fulvifrons*, all of them taken from the nest when eight to ten days old ... The breeding of a small Parrotbill, or Suthora, is probably the first of that genus in captivity ...

'Black-eared Weavers *Malimbus melanotis* built several beautiful hanging nests and laid, but no chicks came out. Rothschild's Starlings, White-winged Blue and Black-faced Scarlet Tanagers did not rear ;their young this year. Tacazze Sunbirds also failed and

a female Violet-eared Hummingbird built several nests without laying. A deplorable loss was that of a cock Scarlet-necked Tanager *Anisognathus igniventris*, killed by another bird (possibly a Pink-crested Touraco) when a brood of two had just hatched in a privet bush. The female failed to raise the chicks.'

(Bird Breeding at Clères in 1972. January-February, 1973. Vol. LXXIX, 16-18.)

'Since its beginnings almost 80 years ago, our magazine has been famous for its beautiful colour plates, depicting rare and interesting birds, either from paintings or photographs of live specimens.

'We must keep up such a happy tradition and I urge all our members who can help to subscribe to our special fund for coloured illustrations.

'It is a pleasure for me to open the campaign with a small donation of £50.'

(Colour Plate Fund. January - February, 1973. Vol. LXXIX, 34.)

'Some twenty miles north of Paris, at 'le Clos du Cédres', Mesnil-Aubry, Dr. Henry Quinque has gathered an unusual collection of rare birds, particularly Parrots and Parrakeets.

.....
'The accommodation consists essentially of a basic block of 30 aviaries designed for Parrots. Each flight is 40ft. long, 4ft. wide and 6ft. high and has a heated shelter. They are elaborately built of steel and concrete, with all sorts of modern devices for the welfare of the occupants. A long indoor corridor and an open air one serve the aviaries at both ends.

'Other aviaries are found in different parts of the grounds, inhabited by other Parrakeets and also by some rare passerine birds, particularly Rothschild's Mynahs, Red Birds of Paradise and a few others.

'The small park surrounding the house is walled-in and has a large pond: Cranes, Flamingos and Waterfowl live there at semi-liberty, as well as a few mammals. A pair of Kagus inhabit an enclosure.

'The following species of Parrots and Parrakeets are represented at present at Mesnil-Aubrey:

Great Palm Cockatoo: A pair, plus a tame male, over 40 years old, which used to be U. Decoux's pet. *Gang-gang Cockatoo*: Three pairs in perfect condition, which have not yet started breeding. *Queen of Bavaria's Conure*: Several tame young specimens,

recently arrived. *Amboina King Parrot*: Also several lately arrived. *Australian King Parrot*: Regularly breeding pairs. *New Guinian* and *Australian Crimson Wings*, also regular breeders. *Horned Parrakeet*: A male of this very rare New Caledonian species. *Uvea Parrakeet*: Two males of this rare species, one of which has produced hybrids with a female *Red-fronted Kakariki*, several pairs of which live and breed there. *Rock Peplars*: Regularly breeding. *Twenty-eight, Port Lincoln, Cloncurry* and *Brown's Parrakeets*. The latter reared a number of young, but Dr. Quinque has some difficulty in keeping them alive after the first six months. A fine pair of *Pesquet's Parrot* has recently been added to the collection.

'Of the smaller species one finds a number of pairs of *Many-coloured, Hooded* and *Naretha Blue-bonnets* which are breeding very successfully.

'*Swainson's* and *Scaly Lorikeets* are also present, as well as some wild-caught Cockatiels.

'We hope that Dr. Quinque will soon report personally on this breeding successes with his rarer birds.'

(A collection of Rare Birds Near Paris. July - August, 1973. Vol. LXXIX, 115 - 166.)

'... We then went to see the remarkable collection of Mr. V. Denton at Livermore... I saw there three males, one female and one young of the extremely rare Bornean Peacock Pheasant, a very scarce bird on that island, for fewer than a dozen specimens are preserved in the great museums of the world. There are also hybrids between it and the Malay, a close relative and only subspecifically different. One of the four pairs of Bulwer's had laid, but the eggs proved infertile; this seems to be the first clutch ever produced in captivity, as specimens at Clères and elsewhere before the last war had never nested ...'

(Some Northern Californian Collections in 1973. March - April, 1974. Vol. LXXX, 65 - 67.

'... One Australian Radjah Shelduck was bred from the old pair which is, I believe, the only pair in Europe, and there is another in the Philadelphia Zoo.

.....
'We lost recently a Green-billed Toucan which had lived at Clères since 1947 and we now have a Guyana Cock of the Rock which came here over twenty years ago; also five Ruffs and an Oystercatcher sent by Copenhagen Zoo in 1946. Those waders, of course, share a large aviary with other birds, but they are not

overcrowded ...'

(The Birds at Clères in 1973. May - June, 1974. Vol. LXXX, 112 - 113.)

'I had the pleasure of paying a visit to Mr. Charles Sivelles at Huntingdon Station, Long Island, early in March 1974. I had been there a few years ago, and I was delighted to see how much his collection of pheasants had increased and improved: it is probably now the finest in the world ...

.....
'We ... find several pairs of Koklass *nipalensis* and Blood Pheasants *Ithaginis cruentus* (both species reared young last year) as well as Satyr and Temminck's Tragopans. There are also two pairs of White Eared Pheasants *drouyni* and an imported pair of pale grey ones which I believe to be the rare *Crossoptilon c. dolani*. Mikado and three forms of copper Pheasant - Ijima's, Soemmering's and Scintillating are present and breeding ...

'More delicate species inhabit a long double row of pens connected with adequate shelters in a large central house with roomy heated compartments on each side of a central corridor. One finds there a dozen pairs of Malay and Bornean Argus which produce many young; different firebacks, including Lesser Bornean and Malay Crestless, and four magnificent pairs of Bulwer's. The latter have not yet started laying, but they are well acclimatised and in excellent condition ... Mr. Sivelles has moreover been very successful with Roulrouls, Tree Partridges *A. torqueola* and the Bustard-quail *Turnix sylvatica* which breed freely ...'

(A Great Collection of Pheasants in New York (Long Island). July - August, 1974. Vol. LXXX, 137 - 138.)

'... The exceptional chilliness of the spring resulted in very poor breeding results with many tropical species. Usually reliable breeders such as touracous, various ground pigeons, Fairy bluebirds and Superb Sparrows failed to rear their broods.' Splendid Glossy Starlings, however, raised two young, the first born in captivity to our knowledge. There were also four Kookaburras and five Orange-headed Thrushes.

'... A pair of Bare-faced Curassows produced three chicks in two broods, first two females, then a male. Sexes can be recognised very early, as the females immediately grow heavily barred feathers.

.....
'I was in Rio de Janeiro, Brazil, from 12th November until 3rd December, 1974, enjoying the hospitality of my old friend Dr. E.

P. Béraut ... His collection ... continues to be excellent ... Mr. C. Cordier had recently brought him species from Bolivia, particularly three Blue-eyed Cocks of the Rock *Rupicola peruviana saturata* and several Sappho Hummingbirds *Sappho sparganura* ... I ... noticed two unusual Brazilian Cuckoos of great interest: a tame hand-reared Squirrel Cuckoo *Piaya cayana* and a large, beautiful Ground Cuckoo *Neomorphus geoffroyi* from the state of Bahia, a very scarce bird of the vanishing primaeval forests. It was interesting to realise how close they are in shape, ways and behaviour to the Indo-Malayan cuckoos of the genus *Phoenicophaeus* ...'

(Notes from Cléres and from Brazil. January - March, 1975. Vol. LXXXI, 35 - 37.)

'There are two remarkably successful bird breeders in the vicinity of the city of Phoenix and I have made a habit in recent years of visiting their aviaries every winter when I am in the western United States ...

'... Mr. B. Roer has a long record of successes with a variety of birds ... He has reared in recent years, among many other species, Crowned, Demoiselle and Stanley Cranes., and also various curassows such as the Great, the Wattled and the blue-billed; he had partial success with the Nocturnal, a rare species which so far has only been completely reared at the Houston (Texas) Zoo ...

'Also in the vicinity of Phoenix Mr. L. M. Ollson, a younger enthusiast, maintains one of the largest and finest collections of tropical and subtropical birds to be found in the western world and he is particularly successful with them. He has built numerous aviaries and enclosures, all of generous proportions and well planted ... They are strictly practical and no visitors are permitted to enter the ground with the exception of other bird specialists.

'... Mr. Ollson has been especially lucky with his Double-wattled Cassowaries *C. casuarius* for he has been able to keep three together, one male and two females, in a roomy pen about 100ft. x 100ft. and planted with trees and bushes ... Mr. Ollson's birds, which were raised together not only tolerate one another, but they have bred during 1974, the two females laying fertile eggs and one young one reared.

'... Argus, different peacock pheasants and others are doing very well, but Mr. Ollson's most interesting achievement is his outstanding success with curassows and other *Cracidae*. His collection of these Central and South American birds is no doubt the biggest in existence and he has reared more of them than anyone else. Crestless *Crax tomentosa*, Salvin's *C. salvini* and Black *C.*

alector Curassows have bred in his aviaries for the first time in captivity during the past three years and many young have been reared; also Great *C. rubra*, Wattled *C. carunculata*, Bare-faced *C. fasciolata* and Blue-billed *C. alberti*. The Norturnal Curassow *Nothocrax urumutum* has laid, but none have been reared ... Mr. Ollson's experiments with curassows and allied species have been of great value to Dr. D. Amadon and myself in our recently published monograph of these birds ...'

(Two Collections of Birds in Arizona. April - June, 1975. Vol. LXXXI, 73 - 74.)

'... I have seen them wild at Cléres on only a few occasions. Nests have been found several times in the hollows of old trees in orchards. A brood of four was brought to us in 1947: they were reared and eventually presented to Mr. Alfred Ezra at Foxwarren Park where they bred. We kept and reared a few at Cléres a little later on ...'

(Hoopoes. January - March, 1976. Vol. LXXXII, 1 - 2.)

'... Seven Cuban Whistling Ducks, however, produced 29 young, the largest brood from a trio, and we had a dozen Comb Ducks from a group of one drake and six ducks ...

.....
'... Two pairs of Orange-headed Thrushes produced 15 young, but only two were saved. They were heavily parasitised by some kind of Roundworm, which, in other birds, are fairly easily controlled by vermifuges; but thrushes do vomit the medicine and therefore cannot be cured ...'

(News of Cléres, 1975. January - March, 1976. Vol. LXXXII, 50 - 51.)

'During a recent visit to Orlando, Florida, on the occasion of the annual meeting of the International Wild Waterfowl Association, I had the pleasure of visiting the fine collection of birds that Dr. and Mrs. Michael Dam maintain in the neighbourhood with the enthusiastic assistance of their two young daughters ... The pheasantry contains such rare species as Bulwer's and all the different firebacks, argus and peacock pheasants, Horsfield's and Edward's, the last named in some numbers. There are many swans, particularly Black Swans which live and breed in a large colony: they are literally resting in a thick bed of duckweed, which covers the waters. These most useful and nourishing floating plants grow so fast that the birds cannot eat them all as they do in less favourable places. Great success is met with Radjah Shelducks, of which I saw well over a hundred - Orinoco and Maned Geese, and a number of tropical and

subtropical ducks: tame Sandhill Cranes roam the grounds.

.....
 'The very large Disneyland, also in the area includes a vast freshwater lake with, in the middle of it, a "Treasure Island", most cleverly landscaped and planted, which is a dream of a tropical jungle. There are several big, well camouflaged flights, with macaws and other parrots, birds of prey, waterfowl, game birds and, particularly, a huge one which visitors enter and cross on a long rustic, winding bridge; Scarlet and Sacred Ibises, Argus, Palawan Peacock Pheasants, hornbills, toucans, Crowned Pigeons, Whistling Duck and a few other suitable species are discovered here and there, just as they would be in their natural habitats, and it is a most successful exhibit. A flamingo lagoon follows before you reach the sandy beach and board a boat to leave that enchanted island.'

(Notes from Florida. October - December, 1976. Vol. LXXXII, 214 - 215.)

'Once again freak weather played havoc with the birds in 1976: we had a very hard frost at the end of May, when many waterfowl were ready to nest, and it just stopped them. Many species simply did not lay, not even usually reliable breeders such as Black Brant and Ross's Geese; we had no eggs from Red-breasted and very few young from Emperor, Greenland White-fronted, Bar-headed and Swan Geese. Unfortunately hybrids cropped up in the broods, Emperor x Bar-headed, Barnacle x Emperor, Barnacle x Bar-headed and Black Brant x Cackling. It is inadvisable to rear together chicks of different species, as they may become imprinted to each other and pair badly.

'Sarus, Demoiselle and Crowned Cranes never nested at all, but a pair of Wattled Cranes laid seven eggs, all of them infertile. A fair number of ducks were reared, none particularly rare. Among the young pheasants were seven Edwards', four being females. Our collection has been much improved thanks to the generosity of Mr. C. Sivelse, Mr. K. Howman and Major I. Grahame, who sent us pairs of Bornean and Malay Firebacks, Ijima Copper, Cheer and other pheasants; also Germain's Peacock Pheasants. We also acquired Bronze-tailed Peacock Pheasants, a species recorded breeding in captivity for the first time before the war.

'A number of doves were reared, particularly Mountain Witch and Bleeding-heart. It was a good year for touracous and we raised four Senegal, three Knysna and one White-cheeked; the latter was produced by a pair living at Clères for more than 20 years. They had never nested successfully before and they are of such a murder-

ous disposition that they have to be kept strictly by themselves in a separate aviary, as they attack even large pheasants.

'The flamingos settled down to breed on the southern bank of the lake in May, building their own nests without any help, the Caribbean seven, Greater one and Chilean five, a little farther away ... They all incubated their eggs normally, but only one (Caribbean) hatched and was reared without any special care.'

(Notes on Clères - 1976. October - December 1976. Vol. LXXXII, 216 - 217.)

This, in its entirety, was the last report from Clères written by Dr. Delacour, 56 years after the first.

'I had long been aware of the existence of two great collections, particularly of game birds, in Mexico ..., but I had not had a chance to visit them until last November, when I found them absolutely remarkable, and though they have been mentioned before in American magazines, particularly by Mr. C. Sivelles ..., I feel that my experience should be recorded in the Avicultural Magazine where I have for so many years described bird collections in the various parts of the world.

'... Señor Jose G. Zunco Arce, a graduate economist, owns and manages an extensive estate at Tuxpan which includes a vast cattle ranch and a large bee farm, besides his collection of living wild birds...

'There are some 200 aviaries elaborately and elegantly built of steel and slender concrete supports on solid vermin-proof foundations, with brick walls and tiled-roof shelters at the back. They are good sized, a number very large and high, containing tall avocado and other trees ... Gamebirds form the most important part of the collection, but there are many other birds... Roomy aviaries are inhabited by crowned pigeons of three species. Nutmeg and other pigeons and doves, parrots, toucans, quetzals and trogons show themselves here and there ... A few hummingbirds are kept in cages and a tame pair live free in the dining-room - an exquisite sight. All species of pheasant available at present are kept and reared in numbers: I particularly noticed Argus, peacock pheasants, firebacks, very tame Bulwer's Pheasants and Ocellated Turkeys. There are also Roulroul and Bhutan Wood Partridges *Arborophila torqueola* and the very rare tree partridges *Dendrortyx* of southern Mexico and Central America, one species, *D. macroura*, breeding.

'Curassows, guans and chachalacas, however, form perhaps the most interesting part of the collection ... All species of Curassow with the exception of the very rare Blumenbach's and Southern

Helmeted are present; also many guans, some of which I had never before seen alive.

‘Among the most unusual are the two species of Sickle-winged *Chamaepetes goudoti* and *C. unicolor*, the Wattled *Aburria aburri* and the Highland Guan *Penelopides nigra*. The last named ... has been breeding well at Tuxpan during the past three years, and I was able to observe immature males with a barred brown juvenile plumage - a peculiar case in the family where otherwise no distinctive juvenile plumage exists, the chicks assuming immediately the adult plumage.

‘Perhaps the most sensational birds in the collection are three huge, strange and beautiful Horned Guans *Oreophasis derbianus* from the high volcanos of Southern Mexico and Guatemala, a striking and very rare species. As big as curassows, thick-set but with shorter legs, their black and pearl-grey colours, red horn, white eyes and curious bill give them an extraordinary aspect. These three fine birds, tame and in perfect condition, have been hand-reared from wild collected eggs. They are thought to be two males and one female, but the sexes are alike in appearance.

‘Most species are represented by several pairs and are breeding, the greatest success having been achieved with the Venezuelan Helmeted *Crax p. pauxi*, of which a good number have been reared during the past few years. Señor Zuno possesses one of the very rare buff-barred females, an unusual colour phase, but she has so far produced only black young...

‘Dr. R. J. Estudillo Lopez is the other outstanding Mexican aviculturist. A trained zoologist and a veterinarian, particularly an expert on poultry diseases, he teaches at the University of Mexico, but he also manages an enormous poultry farm and a laboratory, supplying most of the vaccines used in the Mexican poultry industry. Dr. Estudillo lives in the neighbourhood of the capital city at an altitude of 2,200m. where the weather is never too hot, nor in winter cold enough to injure tropical birds. His 120 aviaries are very well and carefully built... They are disposed in several rows facing one another and separated by large pens for pinioned and non-flying birds such as cranes, rheas and cassowaries (Bennett’s). Farther away is a large enclosure with ponds, the home of flamingos, swans and other waterfowl, bustards, Andean Giant Coots, three species of screamer and trumpeters... There are many crowned pigeons, rare toucans, hornbills, parrots, including four pairs of Hyacinthine Macaws living happily together... Gamebirds, of course, particularly cracids, are very numerous: there are two trios

of Bulwer's Wattled Pheasants, a species reared there for the first time in captivity in 1974, the parents having been brought from Borneo by Dr. Estudillo himself. All the tragopans, firebacks and other species of pheasant now available are well represented and breed regularly, as do Green Peafowl and Ocellated Turkeys. Curassows and guans are, of course, a special feature of the collection, all the curassows being represented except for the Southern Helmeted *Crax unicornis* of which the Antwerp Zoo possesses a pair sent by Charles Cordier from Bolivia and the very rare *C. blumenbachi* from south-eastern Brazil that is on the verge of extinction, but was found again by Dr. A. Ruschi in the State of Espirito Santo. I had recently the opportunity of observing a live pair in the São Paulo Zoo, for the first time..

'Most species of curassow have bred in Dr. Estudillos' aviaries the Great *rubra* since 1965, Wattled 1966, Blue-billed 1971, Razor-billed 1972, Crestless *tomentosa*, Yellow-knobbed *daubentoni*, Venezuelan and Colombian helmeted *p. pauxi* and *p. gilliardi*, Nocturnal *Nothocrax urumutum* all since 1974. There is in the collection a very puzzling male collected in Bolivia. It resembles in the general shape of the bill and crest the Great Curassow, but it is a little smaller, has white tips to the tail feathers and its bill knob is pale greenish-blue, quite unlike other species in colour. It no doubt represents a still unknown form.

'Guans and chachalacas are very numerous: *Aburria aburri* has been breeding there since 1974 and *Chamaepetes goudoti* since 1972, both for the first time in captivity. Among the more unusual species, I noticed a *Pipile cumanensis*, *Penelope montagnii*, *P. superciliaris*, *P. obscura*, *P. perspicax* and *P. pileata*. There are two different subspecies of *P. jacaquacu*; one, from Bolivia, is larger, brighter in colour and a bluer facial skin; its windpipe is not elongated as in the typical form, and it probably belongs to another yet unknown form'.

(Two collections of birds in Mexico. January - March, 1977. Vol. LXXXIII, 50 - 53.)

Dr. Delacour made no contribution to the Avicultural Magazine in 1978, the first year, since he began writing for it in 1916, that he had failed to do so.

'It is about a hundred and fifty years ago that pheasants of many species began being imported, reared and established in Europe. In those days, parks, extensive shooting preserves and game farms were numerous. Their owners were trying to introduce new game birds and most of them maintained pheasantries to exhibit the most

beautiful species, which constituted fine additions to their gardens. Zoological societies, particularly in Paris, London and Antwerp, were organised and they built their zoos; one of their main activities was to import, acclimatise and propagate suitable mammals and birds which could be distributed later to their members...

'When I started collecting pheasants in 1905, many species were still extensively bred. Fine pheasantries were not rare... In fact it was then easy to acquire, each summer, specimens of all the species kept in captivity...

'Pheasant keeping started developing in America at the same time. Until then, only the New York (Bronx) Zoo and a very few others, and privately, Colonel A. Kuser in New Jersey had good collections ...

.....
'Pheasant studies and collections had reached a peak in 1939, but the war destroyed the European stocks to a great extent. A few rare species, particularly Blyth's Tragopans and Crested Argus disappeared and have so far never been replaced.

'There still were, however, a number of birds left in America and even in England. Soon after 1946 others came from their native countries and pheasant collections prospered again. They have now reached a very high standard and I feel happy to witness the accomplishments of many friends, particularly in America. Changes in physical and social conditions have necessitated new techniques and ways to rear birds, and they prove to be adequate.

'The propagation of game birds is the more important at present since most species are threatened with extinction in their native lands by the destruction of the forests, their indispensable habitat, nor to speak of the increasing interference of man.'

(Introduction to the Pheasant Issue. October - December, 1997. Vol. LXXXV, 171 - 172.)

'It never occurred to me that I would have, one day, to write the obituary of Phyllis Barclay-Smith.

'Not only was she considerably younger than I am, but I had found her in a good state of health during a long visit she paid to Clères in August 1979. When she left to return to England, I did not suspect that it was the last time I would see her...

'We had been close friends and associates for a long time. When I first met her, she was a young assistant to her uncle and aunt, Mr. and Mrs. F. Lemon, who in those days managed the affairs of the Royal Society for the Protection of Birds as Secretary. She held that position between 1929 and 1935.

'Soon after the organisation of the International Council for Bird Preservation (1922), of which I am the only founder still alive, I started as its Vice-President for Europe, working with the RSPB, and I came into contact with Miss Barclay-Smith. Here, unusual efficiency was already obvious. Her association with all the ornithologists interested in preserving birds all over the world developed gradually, and in 1935 she became an Assistant Secretary of the ICBP. She soon took over a number of the various responsibilities of the Council, and between 1938 and 1958, while I was its President, she actually managed our activities all over the world, carrying on under my successor, Professor Dillon Ripley, until 1978 when she relinquished her position of Secretary to become a Vice-President.

'All that pertains to birds was Miss Barclay-Smith's greatest interest, not only their conservation in a hostile and ever more threatening world, but their study in nature and their observation and propagation in captivity. She dedicated herself to those various pursuits with an energy and a relentlessness that were a guarantee of success. She became the Honorary Secretary of the British Ornithologists' Union (1945 - 1951) and later on a Vice-President.

'She certainly was an aviculturist in a special restricted way. Living in London, she could only keep a few caged pets, which she did with unusual skill and devotion. Her old friends will remember, in particular, a pair of Yellow-winged Sugar Birds which she possessed for a very long time. No birds have ever been kept with more sentimental and elaborate care.

'The Avicultural Society, just before the Second World War, was in a difficult situation. We had to find a new editor for the Magazine. The late David Seth-Smith, who had been, on and off, its editor for over thirty years, finally had to retire. There was no suitable replacement in sight and our President, the late Alfred Ezra, and I endeavoured to persuade Miss Barclay-Smith to accept the position. She was reluctant to assume a responsibility, but we promised her all the possible help and she finally agreed to try. She edited the Avicultural Magazine for the next thirty-five years (1938 - 1973).

.....
'... Now that hard work appears to have become an oddity, it is difficult to imagine that anyone achieved so much, for so many years. In the course of her incessant activities, she had met all the prominent ornithologists of the world, and many became close friends...

'Miss Barclay-Smith's singular achievements were widely recognised. She was made a member of the British Empire in 1958, and a Commander in 1971. She was awarded the gold medal of the RSPB and the Medal of the ICBP, as well as a number of foreign orders and awards.

'... To-day, when not only birds, but nature itself, are threatened with destruction by man's senseless over-exploitation and consecutive pollution, she will be missed to an extent still difficult to evaluate.'

(Miss Phyllis Barclay-Smith, CBE. January - March, 1980. Vol. LXXXVI, 46 - 48.)

1981 was the only other year during his association with ;this magazine that Dr. Delacour did not write for it.

'It has been a great shock to Len Hill's many friends all over the world to hear that he died suddenly on his return journey from the Falkland Islands that he visited every year. He was not quite 70 years old and appeared to be as fit and active as ever when he left England six weeks previously but he fell asleep on the plane and did not wake up.

'Len Hill was an unusually bright character. He came from humble origins and started working life as a boot boy, living with his parents in the stableyard of the very place that he later acquired, Chardwar Manor at Bourton-on-the-Water. In his youth he became a successful builder and then, because he loved birds, he gathered together one of the best collections in the world in the four acres of gardens at the back of his lovely old manor, the famous "Birdland". He had, without doubt, a very special gift for planning aviaries and enclosures, as well as a great deal of taste, and no space was wasted.

'Now at Birdland there are beautiful greenhouses full of well arranged tropical plants and suitable birds, very pretty outdoor aviaries, lawns, ponds and penguin accommodation...

'There are also excellent educational and public facilities. I remember opening a lecture hall there a number of years ago which was adorned with a beautiful mural by Peter Scott. There was a great reception on that occasion, attended by many of our old members who have since left us. Len Hill was a marvellous host and a very generous man. In the course of the years, he gave many delightful parties for our members - we paid for the reception but the money collected went to our treasury. He was, in fact one of our very best supporters and gave equally generously of his time by entertaining the members at social meetings when he showed films of his birds.

'Len Hill had a flair for special undertakings, the most unusual being the acquisition of two uninhabited islands of the Falklands group, Grand Jason and Steeple Jason. Birds, particularly penguins, are abundant there and he scrupulously preserved them taking only, now and then, a few specimens for his Birdland. He could also write well about this and his other bird activities.

'In these difficult days for private initiative that the world is going through, Len Hill stood out as an exceptional example of free enterprise. The members of our Society, and indeed all those in the world who share our interest in birds, will feel the poorer for his sudden and unexpected departure.'

(Len Hill - An Appreciation. January - March, 1982. Vol. LXXXVIII, 56 - 57.)

This concludes Dr. Delacour's 281st and final contribution to the Avicultural Magazine, written when he was 91. Thereafter, arthritis prevented him from further writing. Physical impairments, however, did not interfere with his command of ornithology and aviculture, as was quite evident to all who knew him in his final years. To the end he took a vigorous interest in the latest developments and enthusiastically expressed his opinions of them... I will close with what he told me in 1985, the year he died, about the Glaucus Macaw *Anodorhynchus glaucus* that he saw on childhood visits to the Jardin D'Acclimatation in the Bois de Boulogne: "It was quite ugly! - Too large a head, too short a tail, an unattractive colour - Not pretty at all. But ... it was the only one I ever saw."

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FIRST CAPTIVE BREEDING OF THE GUAIABERO PARROT

By Roger G. Sweeney

The Guaiabero Parrot *Bolbopsittacus lunulatus*, is a little known species which has only been maintained within aviculture on a few occasions outside its endemic range of the Philippine islands. Those few birds that have been seen in aviculture did not adjust well to captivity and no breeding of this species has previously been recorded. The Research and Breeding Centre operated by Birds International in the Philippines has maintained a number of Guaiabero in captivity for an extended period of time and managed to achieve the first world breeding of the species in 1993. A complete husbandry report is currently in preparation from several joint authors, but given here are my preliminary notes from working with, and breeding, the species.

The Guaiabero measures around 15 cm in length. In appearance it is a short stocky bird with a broad head, a short broad bill, and with short rounded wings and tail. In adult birds sexual dimorphism is clearly apparent. The male has mainly green plumage, which becomes more yellowish on the underparts of the body. The forehead, lores, periophthalmic region, throat and lower cheeks are blue; a blue collar encircles the neck and meets the blue cheeks. Blue is also present upon the bends of the wings. The rump area and upper tail coverts have a yellowish tinge to their green colouration. The upper wing coverts are also of a yellowish green shade. Pale yellow runs across the underside of the secondaries. The bill is grey, becoming black towards the tip; the legs are grey.

The female differs from the male by having blue only upon the throat and lower cheeks, by having a yellow collar on the hindneck (with some fine black markings) and by having similar markings on the yellowish green rump feathers. Notes on the appearance of development of the Guaiabero chick follow later in this article. Fledged immature birds resemble the hen except for the lighter colouration of the bill. In the description given by Joseph M. Forshaw (1989, *Parrots of the World*, Cassell P.L.C.), four subspecies are described. The nominate is listed as occurring from Luzon and has already been described.

B. l. intermedius is listed as occurring from the island of Leyte. The male is described as differing from the nominate by his

underparts being a darker green; the blue on the face being darker with a purple tinge; and by having a brighter blue collar. The female is described as differing from the nominate by the blue colouration restricted to the throat; by having pale green cheeks; having a paler shade of green around the eye; having a more orange collar and by lacking the yellowish tinge to the green rump and thigh colouration.

B. l. callainipictus is listed as occurring from the island of Samar. The male is described as being similar to *B. l. intermedius*, but with the general plumage being more yellowish, particularly on the underparts; the blue on the face being darker and more greenish and having less blue on the cheeks. The female is described as again being similar to *B. l. intermedius*, but having a brighter yellow nuchal collar and rump.

B. l. mindanensis is listed as occurring from Mindanao and Panaon. The male is described as differing from the nominate description by having green cheeks separating the blue periophthalmic region from the blue throat; the blue hindneck collar being a brighter and darker blue; the head has a yellowish tinge contrasting with the purer green of the back. The female is not noted as differing from the nominate description.

To date, the Guaiabero that I have worked with in captivity have all been of the nominate subspecies which occurs from Luzon, except for a single female specimen of *B. l. callainipictus* which came from the island of Samar. In the case of this single female bird, the plumage colouration did not appear to differ significantly from female birds of the nominate subspecies. A brief examination of available skins of the different subspecies in the collection of the Philippine National Museum proved inconclusive as in many specimens the plumage colouration was to some degree faded and the subtle differences in colouration will have to be accurately assessed by comparison with live specimens rather than preserved skins.

In behaviour the Guaiabero is a shy, quiet bird which, when compared with other Psittacines, is to me most reminiscent of the Blue-rumped Parrot *Psittinus cyanurus*. Guaiabero generally move slowly and carefully. As they move around by climbing along the perching, they rarely seem to fly within their cage unless something startles them. For much of the time they seem to take little notice of their respective mates and do not seem to exhibit close pair-bonding, even in the case of the pair which has now successfully bred.

The husbandry of the Guaiabero is very similar to that I use for *Opsittia* species, although the Guaiabero requires even more seclusion and privacy in the accommodation provided. While the accommodation for this species needs to be secluded, it is also essential that discreet regular observation can be carried out by the keeper. This is also a bird that does not like to descend from the level of the aviary perching and is rarely, if ever, seen voluntarily at ground level. Because of this a new design was used in 1993 which allowed for food, water, perching and the nest site to be located all at the same high level within the cage. This is thought to be one of the main reasons why breeding success was achieved for the first time in 1993. The diet of the Guaiabero at the Research and Breeding Centre consists of four small feeds given each day. The first and third feeds consist of various chopped fruits and vegetables including papaya, plantain banana, steamed sweet potato, steamed carrots and chico. The second and fourth feed each day consist of millet seeds, a dry powdered food made from various baby cereal foods, rice cereals, banana and either guava or chico. A commercial brand of multi-vitamins and mineral powder is sprinkled over the food at each feeding period.

From the notes I made of several parent-incubated eggs monitored during the 1993 breeding season, it appears that the incubation period for this species is 22 days. Artificial incubation has not so far been attempted. The eggs are white in colouration and can be considered as of normal appearance and shape for *Psittacines*. Clutches I have observed so far have consisted of either three or four eggs. In the case of the chicks hatched during 1993, in all cases they were incubated and hatched by their parents before being removed and taken to the nursery department for hand-rearing soon afterwards. I made the following notes on one of the chicks reared from the first clutch of eggs.

On being removed from the nest box it was estimated that he chick had hatched around 12 to 15 hours earlier; its weight upon arrival at the nursery was recorded as 8 grams. When newly hatched the skin coloration is light pink, the chick does not have any natal down covering the skin. At this early age the chick is very unstable in its body stance, although it did seem to be quite active.

Day 5 - The chick is now much stronger and can easily maintain an upright body stance. The eyes are just beginning to slit. The toe nails are turning light grey and the bill is white. The upper mandible has a noticeably slender shape.

Day 13 - Both eyes are fully open. The toe nails are now black

and the feet are grey in colour. The first signs of developing pin feathers can be seen forming underneath the skin.

Day 18 - The first pin feathers are just starting to emerge through the skin, those of the flight feathers.

Day 20 - Tail pin feathers are just starting to emerge through the skin, pin feathers are nearly ready to appear over the head.

Day 23 - Flight pin feathers now measure more than 1 cm. Pin feathers are now also emerging through the skin on the thighs, breast and mantle. The tail pin feathers are now well developed.

Day 27 - Much of the head and lower body is now covered by short pin feathers, with the flight pin feathers measuring more than 2 cm. The bill is becoming darker in colour.

Day 32 - Pin feathers are now covering most of the body, except the flank regions. Some flight pins are now just starting to split through their quilling.

Day 35 - The bill is now greyish-brown in colour. The pins covering the head and body are becoming larger and showing more of the feathers colouration through the quilling.

Day 39 - The feathers of the upper wing coverts have broken through their quilling and the flight pins are continuing to split through their quilling at the tips of each feather.

Day 41 - Most of the upper wings are now feathered, there is still some quilling covering the base of the flight feathers. The breast is also feathering with most feathers having broken through their quilling.

Day 44 - The breast, abdomen and sides of the head are now well feathered. Tail feathers are starting to split through the quilling to appear.

Day 48 - The wings, upper back, breast and abdomen are all now feathered, the head is continuing to become more extensively feathered. The feet are grey with black toe nails, the bill is light grey in colouration.

Day 51 - The only areas which are not yet fully feathered are the crown, forehead, ear coverts and the flank regions.

Day 65 - The chick is now fully feathered. Weaning began around day 70 and was completed by day 87. After weaning the weight of the chick stabilised at between 65 - 70 grams.

The Guaiabero remains one of the most difficult members of the Psittidae family to maintain and breed in captivity, but having now achieved successful reproduction for the first time during 1993 it is hoped that more consistent success will follow. A more detailed

description into the captive husbandry and breeding of the Guaiabero at the Research and Breeding Centre is scheduled for preparation towards the end of 1994.

(Note - The author has since left the Birds International collection is now working as an Avian consultant to Loro Parque in Tenerife).

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THE OBI LORY

By Dulcie Cooke

The Obi Lory, *Eos squamata obiensis* is deservedly one of the most popular of all the small to medium sized lories. These very beautiful birds are now becoming well established in the U.K. and on the continent of Europe. As seems to be the case with so many species there is at present a shortage of females. This will probably alter as they become even more domesticated.

Their original homes were the Obi Islands to the west of Irian Jaya, Indonesia, these with the larger island of Halmahera and others form part of the group of islands known as the Moluccas. It is this group which is home to the extremely rare 'blue' Halmahera King Parrot, *Alisterus amboinensis hypophoniurus*.

The clearly defined colours of Obi Lories, crimson-scarlet head and breast, deep purple lower breast, purple leg feathers, black shoulder (scapular) feathers and black and scarlet wings make these birds stand out as a species of exceptional beauty. A bright orange beak, brown eyes and grey legs with a pretty brown and soft red tail complete the picture. Their intelligence, affectionate nature and playful ways ensure that those who see them usually wish to acquire pairs or even single birds as they become available.

Some small to medium sized lories (they weigh about 3½ - 4 oz.) make a lot of noise, which can be very trying in a built-up area; Obi Lories will call when they want to attract attention or when they are hungry, but this call does not carry more than a few metres and the birds are not chatterers in the way which applies to many birds, including some lories. Most of the day Obies remain quiet, amusing themselves happily with whatever is available to them in the form of small branches, dry wood shavings in which to play and roll etc. Watching them at play one is always reminded of two small puppies playing together.

During the first year of their lives Obies viewed from the front look almost like small red and purple partridges with heavily serrated breast colours. These markings are lost over a period of 6 to 12 months so that by the time they reach 18 months or two years of age their beautiful clearly defined red and purple markings will be visible on the breast and the thin serrated scarlet stripe on the wings will state very clearly that these birds are Obies; so also will their black scapular feathers.

Some writers describe their colours (which do vary slightly) as containing some 'grey' round the neck. I can only think that the writers concerned were perhaps looking at museum specimens whose colours had faded considerably. In the years that my late husband I have kept and bred Obies we, and now I, must have seen dozens of them, many of which have been bred at my home. Never ever has a specimen appeared with any grey markings. Many of them have deep purple markings almost like a half necklace, others may have perhaps one purple patch the size of a thumbnail somewhere near the neck.

Obi lories normally reach breeding age in their third year, but I believe that as they become more domesticated they will start to breed at an earlier age. These birds have bred to the second generation here, and now some of those birds are breeding in Holland, making a third generation bred in aviaries. This year a two year old pair of mine appear to be making a serious effort to hatch and rear chicks. This hen laid for the first time at one year of age, the eggs were not fertile. The cock was also one year old. At eighteen months of age she laid again and the pair of them tossed the eggs about and broke them, but now she sits closely and the cock feeds her on the nest at frequent intervals.

Although Obi Lories will enjoy a large house and flight and make the fullest possible use of such accommodation it is not necessary. One pair of mine seems extremely happy in a flight two metres by one and a third metres by two metres high, with a house one metre by one and a half metres by two metres high.

The roof of the house has an inner plywood ceiling and interlining with household insulation 10 cm thick. It is a great help to the birds in the winter months if the walls of the house are also interlined with some smooth washable material such as formica. The roof of the flight is covered with corrugated PVC and the sides are double wired with 'spacers' to keep the wires apart. It is only really necessary to have one lot of wire on the roof if it is to be covered. These birds tend to play a lot on the wire and with these precautions they are protected from cats, foxes, hawks, magpies and squirrels. A wire 19 gauge 1cm x 0.5 cm is recommended.

The floor of the house is made of cement 10 cm thick and in winter is lined with about 10cm of wood shavings. The floors of my flight are of ornamental stones laid on a base of sand or soil with just enough space between each stone to allow of drainage but not to allow even the smallest mouse through. If the flight is in an exposed position it would be advisable to enclose it in the winter

with PVC sheeting. A 'night light' to allow the birds to eat early and late is a great help to them.

Once over the first year Obies are quite hardy if the above measures are taken, but during the first winter young birds should be given every possible protection. If there is electricity in the house it is easy to replace the 'low-night light' with a heat lamp during very cold weather, or even a 100 watt bulb will give some warmth.

Unlike members of the *Chamosyna* family of lories and lorikeets who quickly learn to use their nest boxes, especially in cold weather, some Obi cocks will stubbornly refuse to enter a nest box until they are at least two years of age and sometime the hen will not enter until the cock has investigated. However it is as well to hang the box in the house right from the time a young pair is given a home of their own so that they have plenty of time to get used to its presence.

A nest box 20cm square by two thirds of a metre high is suitable for Obies, with an entrance hole 6cm in diameter - an internal ladder and perch inside and outside below the entrance hole are essential. Since the box is best hung in the house it need not be very thick. Two centimetres is enough. An inspection door is necessary. About 12cm of woodshavings makes good nesting material, which should be inspected frequently especially in winter. Any damp material needs to be replaced with dry shavings.

Babies from the age of two to three days need to have their nesting material or part of it, replaced daily with clean dry and warm shavings. During this operation the babies can be put in a small tissue lined box and replaced very carefully in the middle of the box on the warm shavings.

As with other Lories two eggs are laid. They take about 24 - 26 days to hatch and the chicks will leave the nest at about 8 - 10 weeks of age. They will live quite happily with the parents for some time, unless the parents are either going back to nest, or feather pluckers. In both cases as soon as it is seen that the babies can feed themselves they should be removed to another aviary.

Obies present no problems with food, although I prefer to use my own nectar mixture which I feed twice per day, three times per day when the parents are feeding young; there are many excellent commercial nectar mixtures available. I also use my own dry food which is fed once per day, fresh, and placed next to a water container. I never seed of any kind, but do give the birds a small piece of washed green lettuce daily and sweet apple. Lories and

lorikeets love the pollen and nectar from fresh flowers, the pleasure on their faces when they have a few flowers wired on to a perch is a sight not easily forgotten. Many garden and wild flowers are extremely poisonous, it should be noted that all parts of the rhododendron, including the flowers, are poisonous.

The following flowers are quite safe to give to lories and lorikeets: pansies, wallflowers, fuchsias, roses, wild honeysuckle, small single begonias and Impatiens (busy Lizzies). Small branches of willow, any kind, sweet apple and hazel nut are extremely good for the birds and give them great pleasure to demolish. I am told there is a chemical, Biotin, under the bark of trees which helps to prevent rickets, perhaps the birds sense the value of the bark to themselves and to their young.

Obies bred in aviaries are often delightfully tame and affectionate, and most fascinating to watch with their constant playfulness; some even learn to say a few words.

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HUMBOLDT PENGUINS AT THE COTSWOLD WILDLIFE PARK

By Simon Blackwell

Opened in 1970, the Cotswold Wildlife Park - like many similar establishments - provided a more naturalised habitat and, in some cases, more space for its animals. Among the first occupants of the park's walled garden area was a group of Humboldt Penguins *Spheniscus humboldti*. At the time they were acquired little detailed information was available about these birds, or indeed of any of the other penguin species.

A particular problem was accurate sexing, not only of Penguins but of many other species which were not sexually dimorphic. This was one of the factors which meant there was no successful and continuous breeding of penguins until 1976/7. and despite initial teething problems the following 10 years were very successful indeed and added greatly to our knowledge of these birds.

However, in 1989 we began to experience worrying, and eventually serious problems with the park's group. Over the previous three/four years reduced fertility and hatch-rate were the main symptoms, but suddenly we began losing adult birds.

From that point our main concern was that pathological examination failed to identify obvious problems. By the end of 1990 our colony of Humboldt Penguins had been decimated. Only one bird, bred at the park the previous year, remained.

Our dilemma at this stage was in not knowing what had caused the deaths and thus what practical steps we could take to prevent a recurrence should we introduce new birds to the area. Among precautionary measures taken we changed fish suppliers, added a new water filter system and modified some of our water management techniques.

Having made these adjustments we brought in a new group of penguins which were readily accepted by our lone survivor.

At this point I should emphasise that the park's problem with these birds was by no means unique. In fact at least six other UK collections were experiencing similar difficulties at the time.

Our new group was made up of birds which had survived in other collections and they settled very quickly. One old pair, which had previously bred successfully, reared two chicks. We thought our problems were behind us, but a year later there was a further

recurrence and this time all the birds died.

We had not simply been sitting back over the period. Water and fish samples had been tested and pathologists - some located as far away as the United States - had looked at samples. One common factor was identified in both fish and birds, and this was the presence of Poly Chlorinated Biphenyls (PCBs), derivatives of PVC and the banned pesticide, dieldrin - both of which are now considered a major cause of organochlorine poisoning of some of the world's oceans.

There are still only ideas and theories about their reactions/causes in bodies, but at the time they are certainly thought to have contributed to reduced fertility rates and chick weight problems between 1986-89, as well as being factors which contributed to deaths in 1994.

Eventually, what was regarded as a significant breakthrough was achieved with the isolation in one bird of Avian Malaria. This, we felt, was the result of someone looking specifically rather than it being identified accidentally, so previous Post Mortems could easily have overlooked the possibility as the condition has never been prevalent in the UK, although it is widespread in American collections.

More recently other collections in Britain have identified Avian Malaria and although there is still need for further study we believe we have now got to grips with the problem at the Cotswold Wildlife Park. All our penguins are now given anti-malarial drugs and appear in good condition.

As to why the disease appeared so suddenly and unexpectedly we still do not know, but surmise the climatic changes we have experienced in this country over the past 10 years have enabled the carrier mosquitos to flourish.

Penguins have no immunity to Avian Malaria. The affected may also have already been weakened by the level of pollutants in their systems before the onset of the disease.

A final question is why Avian Malaria has been a problem in only a limited number of collections to date? This and many other questions need to be investigated and will be undertaken by the Penguin Taxon Advisory Group, part of the Joint Management of Species Programme under the auspices of the Federation of Zoological Gardens of Great Britain and Ireland.

The endeavours of the last few years, and the future, have and will continue to promote considerable investigation into many aspects of penguin husbandry. We hope it will contribute to the

future of the Humboldt Penguin which, although the most common in world zoos, is the rarest member of the family in the wild.

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LONDON ZOO NOTES

By Simon Tonge

A pair of young White Pelicans *Pelecanus onocrotalus* has been received from Prague Zoo in a joint shipment with St. James's Park. After completing quarantine a few weeks ago they were added to the zoo's flock.

In the Southern Aviary, a pair of Abdim's Stork *Ciconia abdimii* reared three chicks in a nest in a willow tree. Other recent breedings include Eurasian Stone Curlew *Burhinus oedipnemos* which was hatched and parent-reared in the African Savannah Aviary by the Bird House. An Inca Tern *Larosterna inca* hatched in the Snowdon Aviary but did not survive.

A second Black-backed Fruit Dove *Ptilinopus cinctus* was hatched in July and successfully reared by its parents. This pair has now fledged four young in two years. The first three were males. The sex of this latest youngster had not yet been determined at the time of compiling these notes.

The zoo's pair of Imperial Green Pigeons *Ducula a. aenea* continues to breed well and three young have been produced so far this year. All those sexed to date have been females!

Other species hatched are: Livingstone's Touraco *Tauraco (corythaix) livingstonii*, White-faced Scops Owl *Otus leucotis*, Lilac-breasted Roller *Coracias caudata*, Silver-throated Tanager *Tangara icterocephala* and Emerald Starling *Lamprotornis iris* (DNS).

A female Black and White Casqued Hornbill *Bycanistes subcylindricus* has arrived from Lotherton Hall Bird Gardens (Leeds); two pairs of Bali Mynahs *Leucopsar rothschildi* have been received from the Jersey Wildlife Preservation Trust; and a group of Common Waxbills *Estrilda melpoda* and their parasitic host, the Pin-tailed Whydah *Vidua macroura* have been received courtesy of Mr. Martin Capel.

London Zoo has organised the purchase of 14 fruit pigeons and doves of five species - Pink-capped *Ptilinopus regina*, Pink-spotted *P. perlata*, Jambu *P. jambu*, Black-naped *P. melanospila* and Pink-necked Green Pigeon *Treron vernans* - from a private keeper.

The birds have been distributed between London, Bristol and Chester Zoos to augment Zoo Federation breeding programmes currently run by the Pigeon and Dove Taxon Advisory Group.

The zoo's male Andean Condor *Vultur gryphus* 'Carlos' has been sent to the Yorkshire Dales Falconry Centre in exchange for a female Lappet-faced Vulture *Torgos tracheliotus*. He has settled well and is now being flown.

Finally the White Woodpeckers *Melanerpes candidus* have a new enclosure courtesy, appropriately enough, of Tippex Limited! With specially designed nest boxes sunk into upright tree trunks and food dishes also inset into the trunks, it was hoped breeding behaviour might commence rapidly. Unfortunately the male let us down badly by dying suddenly, two days before the enclosure was completed. Does anyone know of a spare male in the UK?

* * *

THE PRESIDENT'S GARDEN PARTY 1995

By Stewart Pyper

On Sunday 4th June some 75 Members and their guests accepted the kind invitation of the Society's President, Miss Ruth Ezra, and Vice-President, Raymond Sawyer, to visit their home at Cobham (Surrey) and view their superlative collection of birds - together with various mammals and giant tortoises - in a beautiful garden setting.

This is the finest private collection in Britain - probably in Europe - and we were blessed with a dry, if not warm, day. The anticipated rain failed to materialise so that we were able to enjoy a leisurely tour, seeing all manner of rarities.

It was also an occasion to meet fellow Members, some of whom had journeyed many a mile to get to Cobham - although none more so than Joseph Forshaw, Australian author of *Parrots of the World*, *The Birds of Paradise and Bowerbirds* and other classic ornithological works, who was holidaying in England at the time.

This was the third year we had admired a large aviary, now surrounded by clematis and roses, which had been built in front of the house in 1993. Among its inhabitants were Island Thrushes which were breeding. Taxonomically, there are nearly 50 subspecies endemic to a significant number of Pacific islands, ranging from those of substantial size, such as Java and Borneo, to others which are little more than a speck on the map.

The perching in this aviary is arranged so that the occupants fly its full length when their real beauty can be appreciated. Among occupants widely admired was a beautiful pair of Gldenstadt's Redstarts.

Crowned and Demoiselle Cranes, together with Oystercatchers, were much in evidence in lawned areas, but most of the giant tortoises were inside - either close to, or under, heat lamps.

Parrotlike birds in the collection include pairs of Hyacinthine and Scarlet Macaws, Eclectus, various Cockatoos, Keas, Stella's and Red-flanked Lorikeets, Crimson-winged and Lutino Princess of Wales' Parrakeets, and Philippine Hanging Parrots. Nearby we saw Red-bearded, Carmine and White-throated Bee-eaters.

A young Splendid Starling had fledged earlier that morning, but after being attacked by Stilts sharing the aviary it was quickly recaptured and returned to the safety of the nest. There are three pairs and a single male of these birds at Cobham, together with Royal, Emerald and Amethyst Starlings.

Green Wood Hoopoes were nesting in an aviary which also housed a Rufous Motmot - perhaps the only one in Britain. This particular bird had escaped earlier this year but returned to the aviary after a few days' freedom. On the day of our visit an Azure-winged Magpie had decided to absent itself and there was general concern that it would be recovered safely.

In the Tropical House - home to some superb exotics - a pair of Splendid Sunbirds had hatched a single chick but unfortunately it failed to survive. Close by, Long-tailed Broadbills were showing clear signs of breeding behaviour while Rufous-bellied Niltavas were nesting.

Other avicultural gems here include various hummingbirds, pittas, Purple Honeycreepers, Scarlet Minivet, Greater and Lesser Niltavas, Golden-headed Quetzal, Superb and Paradise Tanagers. The latter birds had nested, but unsuccessfully. Among the house's more active inhabitants was a charming group of eight Red-headed Tits which seemed to be constantly on the move.

Bartlett's Bleeding-heart Pigeons had reared young by the time of our visit, as also had Avocets and Black-necked Stilts. Raymond had bred Jacanas in 1994 and again this year so we were privileged to see a single youngster, only a few days old, with its parents.

Other species to take the eye were Grandala, Giant Hummingbird and Blue Whistling Thrush (which had also bred again this year). I can't remember seeing a Blue-fronted Redstart before - a beautiful bird. And for the show enthusiasts among the President's guests there was a magnificent male Mrs. Gould's Sunbird which appeared faultless.

Following a delicious tea, the Society's Chairman, Bob Hodges expressed thanks on behalf of those present for the generosity of our hosts in welcoming us into their home.

Finally, the occasion was nicely rounded-off when the President presented Certificates of merit for first breedings to Chester Zoo (Taveta Golden Weaver, White-headed Buffalo Weaver, Pied Starling, Long-tailed Glossy Starling, Ashy Starling, African Grey Hornbill, Trumpeter Hornbill, Greater Vasa Parrot and Channel-billed Toucan); The Tropical Bird Gardens, Rode (Greater Coucal and Golden-breasted Mynah); Leeds Castle, Maidstone (Fischer's Touraco and Von der Decken's Hornbill); Bristol Zoo (Peruvian Stone-curlew) and the Jersey Wildlife Preservation Trust (Mauritius Kestrel). A Certificate of Meritorious breeding went to Ken Dolton (Duivenbode's Lory).

BOOK REVIEW

New from Oxford University Press, *A GUIDE TO THE BIRDS OF MEXICO AND NORTHERN CENTRAL AMERICA* by Steve N. G. Howell and Sophie Webb deals with 1,070 species found in Mexico, Guatemala, Belize, El Salvador, Honduras and western Nicaragua in a concise but informative way under such headings as Identification, Voice, Habitat, Similar Species, Status and Distribution, and Range - including an outline of the world range of each species where applicable. Other useful information is attached to some species under the heading NB (Note) and may include useful information about the taxonomic status of a species, and brief descriptions of related or similar species that may be expected in the region.

The layout of the book is typical of modern field guides with greater emphasis on identification, voice and habitat than breeding behaviour. As such it will be invaluable to birdwatchers travelling to any of the countries covered. Range maps are provided for all species' accounts.

Separate chapters deal with the area covered by the book, geography and bird distribution, climate and habitat, migration, history of ornithology in Mexico and northern Central America, conservation, and birdwatching in the area.

There is much to be admired about this hefty, 850-page volume. I particularly like the detailed descriptions of songs and call-notes - thus for the Rufous-tailed Hummingbird *Amazilia t. tzacatl*: 'A fairly hard, smacking *tchik-tchik* ... or *tchi-tchi* ..., at times repeated insistently, and dry, hard chips, often run into a rattling *chirr-rr-rr-rr-rr*, etc. Song varied, high, thin, squeaky chipping, *tsi*, *tsi-tsi-tsit tsi-tsi-tsi*, a shorter *t'sin t'sit t'chin* and *tsi-sink si-silk tsi-sink*, etc.'

The 71 colour plates contributed by Sophie Webb are outstanding. Their accuracy makes the task of identifying the region's species that much easier and the book will thus be welcomed not only by ornithologists and birdwatchers, but also by serious aviculturists. In addition to the colour plates, there are numerous black and white illustrations of the same high quality throughout the text.

The book is strongly recommended to anyone with an interest in the area's avifauna. It is an invaluable addition to even the most comprehensive reference library.

A GUIDE TO THE BIRDS OF MEXICO AND NORTHERN

CENTRAL AMERICA is published by Oxford University Press, Walton Street, Oxford, OX2 6DP. Hardback £50.00 Paperback £25.00 Available from OUP or specialist booksellers.

F. W.

* * *

NEWS AND VIEWS

SUCCESSFUL REINTRODUCTION

In the United States, The Peregrine Fund has announced the discovery of a nesting pair of Aplomado Falcons *Falco femeralis* in Cameron County, Texas - the first record of a wild nest in 54 years. In 1982, Peregrine Fund scientists discovered a remnant falcon population in southern Mexico. The Mexican government permitted 10 chicks to be taken from 10 different nests for rearing and breeding at the Fund's World Centre for Birds of Prey in Boise (Idaho). In 1993 and 1994, 26 young Boise-reared falcons were released at Laguna Atascosa National Wildlife Refuge, near Harlingen (Texas). 'The first wild nest in 54 years is a credit to all involved', said Refuge Manager, Steve Thompson.

WILDLIFE CONSERVATION

* * *

BOTULISM AGAIN

Many UK waterfowl collections experienced serious problems with Botulism during this year's late summer hot weather. Both public and private collections have been affected and one of the worst reported cases was at the Duke of Marlborough's estate at Blenheim where more than 100 swans, ducks, Coots and Moorhens fell victim to Botulism 'C'

* * *

SUCCESS WITH NILTAVAS

The startling turquoise and royal blue plumage of the male Yunnan Large Niltava *Niltava grandis griseiventris* make it a particularly eye-catching bird. But a pair of this infrequently seen subspecies of the Large Niltava, in the collection at San Diego Zoo, has proved not only an appealing exhibit, the birds have recently reared a single chick - a first for the zoo.

The adults chose a palm in their aviary in which to build a nest, the female almost disappearing into the plant when she was incubating. Three chicks hatched but only one - a male - survived and is now in adult plumage. Meanwhile the female is incubating a second clutch.

ZOONOOZ

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RENEWAL PLANS

The Zoological Society of San Diego, which celebrates its 80th birthday in 1996, is to launch a *Renew The Zoo* campaign with the aim of renovating existing facilities - at both the zoo and wild animal park - which do not need replacement. Among projects

scheduled for renewal is the Rain Forest Aviary. Constructed in 1928, it is the largest walk-through aviary for Asian birds at the zoo and currently houses 39 species. Together with the adjacent Parker Aviary, structural, horticultural and 'predator-proof' refurbishment will be carried out.

In 1980 the zoo embarked on a major rebuilding campaign to transform old grotto-style exhibits into nine bioclimatic zones which have been painstakingly designed to approximate nature, while presenting animals as members of social groups rather than lone representatives of their species. These multi-species exhibit complexes allow visitors to observe animal behaviour as they relate to their own species, in close proximity to naturally occurring neighbours.

ZOOLOG

* * *

TWO IN THE NEST

The first record of two Lappet-faced Vultures *Torgos tracheliotus* being reared in the same nest has been reported from South Africa. The nest was located in the Namib-Naukluft Park in a 15 m. high *Acacia*. It is believed to be the seventh record of the species laying a two-egg clutch in Namibia and the first-ever record of two young being reared.

OSTRICH

* * *

FIRST CAPTIVE HATCHING

The first captive breeding of Campbell Island Teal *Anas aucklandica nesiotis* has occurred in the New Zealand Department of Conservation's National Wildlife Centre in Wairapara. The only known wild population of these flightless birds numbers some 50 - 100 and is confined to Dent Island off the West Coast of Campbell Island.

FOREST & BIRD

* * *

OSTRICH PROJECT

A programme to reintroduce Red-necked Ostrich *Struthio camelus* into the former range of the now extinct Arabian subspecies *S. c. syriacus* has been started by the National Commission for Wildlife Conservation and Development in Saudi Arabia. Seven birds of Sudanese origin (*S. c. camelus*) have been released into the Mahazat As Sayd Protected Area in western Saudi Arabia. They are being monitored to establish whether they will survive and breed without supplementary food and water.

Re-Introduction News

MIXED FORTUNES

White-headed Duck *Oxyura leucocephala* populations have declined dramatically this century, the main causes being hunting and loss of habitat. The Wildfowl & Wetlands Trust has been involved in the conservation of this species for several years and reports that the Spanish population has recovered after being near to extinction in the 1970s, while the main wintering site, Burdur Gölü in Turkey, is now officially protected.

Hybridisation with the North American Ruddy Duck *O. jamaicensis rubida* remains a problem, however, and additionally there is now a new threat to birds wintering in Greece.

The most important site for wintering White-headed Ducks in Greece is Lake Vistonis which held 850 - 900 birds in December 1994. Though this has been designated a Ramsar site and Special Protection Area, the Trust has recently heard that there are plans to construct a large dyke to enable reclamation of marshland adjacent to the south south-eastern part of the lake - exactly the area where the White-headed Ducks winter. WWT has expressed its concern and offered help to Greek conservationists.

WILDFOWL & WETLANDS

* * *

The lack of small pools and other places where they can find drinking water during the dry season, which have disappeared because of climatic changes, together with the switch from growing sorghum and millet in favour of maize, are thought to be the main reasons for the scarcity of the most localised of the African lovebirds, the Black-cheeked species *Agapornis nigrigenis*. This is the conclusion of a survey into its status and distribution in south-west Zambia, the results of which are published in the latest Bulletin of the African Bird Club, Vol. 2, No. 2.

Altogether 2,127 were counted during the two-month period, and the total population was estimated to be about 10,000. Tim Dodman says, that during the dry season, there appeared to be two sub-populations, a northern one of about 3,800 birds, and a southern one totalling about 6,200.

Older villagers recalled how in the 1920s and 1930s, the lovebirds were far more numerous and were widely regarded as pests, because they attacked their sorghum and millet crops. They were able to earn a welcome income by trapping and selling them - 16,000 were trapped in four weeks in 1929.

Malcolm Ellis

* * *

BARN OWL RESEARCH

Since the 1930s Britain's Barn Owl *Tyto alba* population is estimated to have declined by about 70 percent. The loss of choice feeding habitat has been identified as a major cause of this sad decline. In addition, many traditional nesting places have been lost. Old barns have been allowed to decay and collapse, or have been demolished, while others have - and continue to be - converted into expensive country homes for the human population.

Because of this The Barn Owl Trust launched its Barn Conservation Research Project in April 1990, which monitored 20 separate study areas in south-west England. It found that on losing their nest site in a barn, the owls can disappear from the entire area, even when there appears to be plenty of alternative sites they could move to. However, if during the conversion of a barn, provision is made to include a new nesting site for them, they are likely to return, and activity may even increase slightly.

These are some of the findings published now in, *Barn Owls on Site, A Guide for Developers and Planners* by Frances and David Ramsden. A 48 page booklet, with 17 colour pictures, it is described as 'essential reading for those involved in the development of existing Barn Owl sites or wishing to encourage these birds'. It also provides background information on problems Barn Owls face, explains the protection given to them in the UK under the Wildlife and Countryside Act, and is a practical guide for anyone conducting a Barn Owl survey, wanting to identify or age pellets, or simply wishing to know more about these enchanting owls.

It is available from the Barn Owl Trust, Waterleat, Ashburton, Devon TQ13 7HU, England. It is priced £5.00, which includes postage and packing.

Malcolm Ellis

* * *

LITTLE EGRETS INCREASE IN UK

Until 1958, only 23 Little Egrets *Egretta garzetta* had been recorded in Britain. During the following 30 years, up to 1988, that figure rose to 458. The numbers have continued to rise each year, and the totals for 1993 and 1994, both peaked at 400. They took the overall total past 1,300, and it can no longer be considered a rarity.

Little Egrets bred in northern France for the first time in 1978, and in Holland for the first time the following year and - according to an account in Bird Watching, July 1995 - a juvenile ringed there that year was shot in Lincolnshire later the same year. However,

they are most likely to be seen along the south coast of England, from Cornwall to Sussex, but can turn up almost anywhere. Increasing numbers, most of them juveniles, thought to originate from north-west France, start arriving in Britain in mid-July and reach a peak in late August. Many remain throughout the winter and, presumably, through into the spring. So, if this trend continues, surely it will not be long before this species breeds in Britain - if it has not done so already!

Malcolm Ellis

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AVICULTURAL MAGAZINE back numbers. Large stock available including some early issues. Sales by post only. List in preparation, please apply to the Hon. Secretary, Avicultural Society, c/o Bristol Zoological Gardens, Clifton, Bristol, BS8 3HA, England.

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1995

CENTENARY CELEBRATION ISSUE

THE AVICULTURAL SOCIETY

The Avicultural Society was founded in 1894 for the study of British and foreign birds in freedom and captivity. The Society is international in character, having members throughout the world.

Membership subscription rates per annum for 1995 as for 1994: British Isles £18.00; Overseas £21.00 (plus £6.00 for airmail). (U.K. funds please). The subscription is due on **1st January of each year** and those joining the Society later in the year will receive back numbers of the current volume of the AVICULTURAL MAGAZINE.

Subscription, changes of address, orders for back numbers etc. should be sent to:

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THE MEMBERSHIP SECRETARY, Stewart Pyper, 21, Primrose Hill, Nunney, Frome, Somerset, BA11 4NP.

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ADDRESS OF THE EDITOR

Hon. Editor, The Avicultural Magazine, % Bristol Zoological Gardens, Clifton, Bristol, BS8 3HA, England.

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THE JOURNAL OF THE AVICULTURAL SOCIETY

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THE CENTENARY CELEBRATIONS ISSUE

Although somewhat delayed it is hoped that you will all enjoy this the 4th issue of 1995, namely Vol. 101 No.4. This issue contains the talks given on Saturday 10th September 1994 at Bristol Zoo. Your council had wondered what should be done to celebrate the 100th anniversary of the *Avicultural Society*. It was thought that a two day meeting held at a weekend would suit most people who wanted to attend. A sub committee with Ken Lawrence as chairman was set up in the autumn of the previous year to organise and keep your council informed. The other members were Mike Curzon, Geoffrey Greed, Stewart Pyper and Raymond Sawyer. Much thought and debate took place and the offer by Bristol Zoo who have all the necessary facilities was finally accepted. The Saturday would be talks, 6 to 8 in number, (eventually 7), followed by an evening dinner. Sunday morning would be a conducted tour of the Zoo.

The directors of the Tropical Bird Gardens at Rode kindly offered to allow members to view their collection in the afternoon and to provide tea. This was readily accepted.

The theme of the talks was to be about what aviculture has achieved and its future. A wide range of topics was required and hopefully when you read them you will find them as interesting and informative as those who attended.

The Lord Mayor of Bristol agreed to attend our evening dinner and we were all greatly honoured by her presence. The weather on the Sunday was warm and sunny and the tour of the Zoo in the morning was well attended. Duncan Bolton and Geoffrey Greed showed us around. Most of those attending then went to the Tropical Birds Gardens at Rode where Betty Risdon and Mike Curzon entertained us. As you are all aware Donald Risdon had passed away in April.

This issue is completed with more articles very kindly sent in to the Society. At present who will be your Editor is unknown. Please continue to send in articles, notes etc., for publication to our address at Bristol Zoo at present. Your subscriptions for 1996 are also now due.

CENTENARY CELEBRATIONS

1894 - 1994

The Chairman (G.R. Greed) opened the Centenary Celebrations by welcoming all present on behalf of Bristol Zoo. He said that he was privileged to be the honorary secretary/treasurer of this wonderful Society. He then asked Miss Ruth Ezra, President of the *Avicultural Society* to officially open the proceedings by saying a few words.

Miss Ruth Ezra - "I am very pleased to greet you all here today. I am proud to be President as my father was for many years. I hope that it will be very successful and enjoyable. Very pleased to see you all".

The Chairman continued:- Ken Lawrence and his team have organised this seminar and had at the last minute to re-organise the programme. The first lecture this afternoon will be Roger Wilkinson's.

* * *

The following talks were then given :-

R.C.J. Sawyer

Famous Aviculturists around 1950

Having had the chance to look through some of the old *Avicultural Magazines*, you will read about many different and wonderful things that these members did. They were quite outstanding.

When I joined the *Avicultural Society* in 1949, there was only really David Seth-Smith who was left to remind us of the early founder members. He was a wonderful person who was curator of the birds at London Zoo. As you know, he had a vast knowledge of all sorts of birds. He could relate back to all the different founder members he knew in those days and was a very interesting person to talk to. He was also Editor of the Society's magazine for many years, and the backbone of the *Avicultural Society*. In those early days he served as secretary and Editor in different times. All the council members in those days lasted for a very short time. Our Editor Phyllis Barclay-Smith who held down the editorship for 35 years, which is pretty remarkable, was a great help to aviculture. She was a great help because she was in contact with all the international conservation groups, which helped bring together aviculturists and ornithologists alike.

Then we had people like Miss Maud Knobel who was secretary/treasurer to the Society for many years who was another great character. We don't have those people around today. She was secretary/treasurer for 26 years, and was very fond of Parrots. If you should visit her house she had about 20 Parrots in her bedroom. After 26 years she relinquished her position as she was getting on in years and a collection was made for her retirement. I believe a total of £500, was raised, which was a lot in those days. She was so thrilled she said she couldn't possibly retire and she would stay on. It fell to David Seth-Smith the following year to tell her it really was time for her to retire, as she had been in the job a long time. She never spoke to him again. That goes for friends in the aviculture world.



Photo © D. Avon

The Speakers at the Avicultural Society Centenary Celebrations

R. C. J. Sawyer

M. Reynolds

D. Avon

G. R. Greed

Debra Bourne

Dr. R. Wilkinson

G. E. S. Robbins

Arthur Prestwich then took over who was another great secretary/treasurer in the Society. When I joined the Society he was just secretary/treasurer and he did a wonderful job for 21 years, with Kay Bonner, as his assistant. They were of independent means and had an office in their house at Oakwood. Kay Bonner used to do all the typing, and it ran very smoothly for 21 years. He used to have a big collection of birds at Oakwood. He was awarded a "first breeding" medal for the first Red-faced Lovebird. I went with John Yealland to witness the breeding which took place in a bale of peat.

Our next secretary/treasurer was Harry Horswell. He was secretary/treasurer for about 20 years. He kept quiet a large collection of Waterfowl and Parrots. His assistant was Mary Harvey. He was a wonderful host and welcomed all members to the various meetings which were held.

In the old days there were wonderful collections, many of which were documented in the *Avicultural Magazines*. Our past President Mr Ezra had a most magnificent collection at Foxwarren Park. On entering Foxwarren Park one was immediately aware of the peace of the place. Mr. Ezra also kept a few birds in his bedroom. He had a Swallow-tailed Hummingbird which he kept for some eight to nine years, which he let exercise around the room. It was he who really discovered a food for nectar feeders, for in those days nobody had really kept Hummingbirds or Sunbirds. His pioneering diet, which is very old fashioned now, was Mellin's Food condensed milk and honey, diluted with water. He had some wonderful species including the Pink-headed Duck which were unique. His brother Sir David had sent them from India. He let M. Delacour have one or two pairs but unfortunately they never bred. With all the modern foods and diets available today, there would have been much more possibility of them breeding, had they been available then. In those days they were probably fed on wheat and middlings, and they really hadn't got great varieties of foods. Mr. Ezra also started the garden parties, where once year we all went and enjoyed the afternoon at Foxwarren.

These people, were the pioneers of aviculture because they had no electricity in any of their aviaries as there was hardly any electricity then. They had none of the facilities we have today such as ultra violet and infra red lamps. At the places like Foxwarren they had boilers, which men used to stoke up in the greenhouses.

I was lucky enough to know the Duke of Bedford. In fact he was quite a friend. He died in an unfortunate shooting incident. His home at Woburn Abbey was another quite remarkable place. He would take you round in his taxi and know exactly where every herd of deer were lying in the 3,000 acre park at different times of the day. He kept large collections of many species, Crane, Waterfowl, and he was very well known for his Parrots. He had large aviaries which his staff would push on rollers to a new site in the park every six months, so that they didn't get infected with worms, because they didn't

have the wormers to deal with the birds like we have today. He used to have shelters with small oil heaters underneath to keep them warm. He kept Leadbeater's and Gang-Gang Cockatoos plus many other species out in the middle of the park. This wouldn't be possible today because they would most likely be stolen.

John Spedan Lewis was another pillar in aviculture and one of our vice presidents who lived at Leckford on a large estate. He kept different species going such as Owls and he tried to get every species of Owl. He had a tremendous collection. Miss Chawner who looked after the collection bred a number of Owls. Spedan Lewis also had Waterfowl and Cranes, but the Owls and Cranes were gone by the time I visited him. He only kept Waterfowl and Pheasants. He had Satyr Tragopans which he sold for £25 a pair, fairly cheap in those days. Terry Jones managed the collections after Miss Chawner. He was very keen on Waterfowl and fancy Pigeons. He was there for many years until he retired. He still lives in Devon.

Jean Delacour was probably the greatest aviculturist of all time. As a very young man he started a collection before the First World War had the largest collection of birds that anyone had in France and even possibly Europe, at the time. The collection was totally destroyed in the First World War. After the First World War he brought Cleres, and started a collection again. I remember him telling me as the men were coming out of the war he employed 112 to get the place as he wanted it. He got them to dig lakes by hand and got all the aviaries ready by the following spring. He kept a magnificent collection between the First and Second World Wars. They must have been great days in aviculture, because so many birds of different species were available. In those days the birds were escorted in by boat as there was no air travel. There were collectors such as Walter Goodfellow, and Shaw Mayer who used to go to New Guinea and collect many species of Birds of Paradise. Cecil Webb collected many rare species from Africa. He was curator of mammals and birds at London Zoo after which he went to Dublin where he became superintendent. Jean Delacour collected numerous times when in Indo-China.

These collectors were mainly sponsored by wealthy aviculturists and Zoos. They used to go and collect birds and get them established, so that by the time they got back to this country they were in excellent condition and make them less difficult to keep. Wilfred Frost who must have been 80 when I met him, used to bring back many interesting birds by boat. He used to live in Singapore where he collected birds and then bring them back to London Zoo where he would stay in one of the cattle houses at the Zoo. He used to live with the birds until he had sold them all. He used to import a few mammals as well. His eyesight got so bad he used to have to put his finger in the water pots to feel if there was any water in them. I was able to obtain some Birds of Paradise and other specimens from him in my early days.

Tom Goodwin was another collector. He used to go to Australia a lot but always seemed to be unlucky. He came back just before the Second World War with a big collection of Australian species and Bowerbirds for the late Reg Partridge.

Reginald Phillipps, another noted aviculturist, bred Fairy Blue Wrens and Regent Bowerbirds in a back garden in Hammersmith. I remember around 1949/50 going to collect a crate of Hummingbirds from London Airport. In those days the offices were only in army huts. I brought a crate of some 14 or 16 Hummingbirds from a dealer called Randau in Brazil, for £48, delivered. Twelve birds were supposed to be sent but he put in 16 in case there was any losses on the way. The captain had to be consulted before any birds were taken on the plane, and quiet often he would have the Hummingbirds in the cockpit with him. We used to have the same problem with customs that we still get today.

Dr. Searle used to send me some birds from Hong Kong. Once he sent me some Scarlet-backed Flowerpeckers, and on arrival we had to wait hours for customs clearance. I was asked to look at the birds by the airport staff as they thought they were all dead. The birds were lying on their backs. To my amazement one of the bird's legs started to move and within half an hour we had got them recovering thanks to help from the customs officers.

In the early 1950's I went with Claude and Dorothy Payne together with Sidney Porter, who was another great aviculturist, (many wonderful articles by him have appeared in the magazine), to Holland and I visited Louise Bird Hall at Wassenaar Zoo. Their enormous greenhouse aviary was the largest in Holland and they had flocks of Resplendent Quetzals and Cocks of the Rock together with many more species. We spent several hours just watching them. I mention this as we have Jan Louwman here today. As far as I know we are the only two people who attended the Diamond Jubilee Celebrations in 1954.

Dick De Quincy was another outstanding aviculturist. He took up birds in a big way in 1950. He had kept a lot of birds before the Second World War. He had a lovely place at The Vern, Hereford, where he built some beautiful aviaries and tropical houses, and that is there where we bred the Streamer-tailed Hummingbird. It was my cock bird that went on to win at a National Show after he had finished his breeding activities. Dick was an outstanding aviculturist who had great taste. Reg Partridge, was another person who kept a great collection. Also Sir Crawford McCullagh Bart in Northern Ireland was a great Parrot collector. He had a tremendous range of aviaries housing a great variety of Parrots. In later years he became a vice president of the Society and he also built up a large collection of Waterfowl.

Sidney Porter was another outstanding person. He unfortunately died when he was about 56 years old. He had terrible asthma. He used to go

abroad to avoid our winters. He lived in Derby which always seemed to be permanently cold. He travelled all over the world to Singapore, the Indonesian Islands and New Zealand bringing back unusual birds. In his later years he often went to California. In New Zealand they had restrictions even in those days. He was very anxious to bring back the Poe-bird or the Tui as it is more familiarly known. It is a nectar feeder that appears black and is sometimes called a Parson Bird because it had a white ruffle on the neck. He used to tell the story of how he collected them. He had some cages made, in which he put some Pigeons. When he got on board ship he let the Pigeons out, and the Tui's, which had come on board in boxes, came back in the cages. That is how he managed to bring them home. He also was a great collector of books, of which he had some magnificent monographs, which he left to Nottingham University. He always said that books would live longer than birds.

Ken Norris was another great aviculturist and friend to the Society, who had several first breedings, as was the late Donald Risdon. Donald bred the first Umbrella Cockatoo. Keston Foreign Bird Farm, where Boosey and Brooksbank lived, was one of the earliest dealers in the country, and the most highest esteemed. Boosey was also a vice-president of the Society.

Noel and Ronald Stevens, used to live at Walcot. They kept wonderful birds, and they built a lake, which was approx. 12 acres. It was very attractive, but it was not very practical to breed Waterfowl on. They lived in a vast mansion, but they gave up, and Ronald went to live in Ireland, and Noel lived at Hope Bagot. They had a most impressive place. In fact they were given all the park birds and deer from Foxwarren when Mr. Ezra died.

Herbert Whitley was another eccentric who unfortunately I never met. He was an expert in animal husbandry and whatever he kept he succeeded with. He had some very set ideas. Jean Delacour used to tell about his enormous aviaries, with a pair of Crows in, while he kept many things like Birds of Paradise in small enclosures. The year after when visiting Mr. Delacour would say, "What are you doing with these Herbert?", and he would say he was still studying them, and a year later they were still in small cages. I don't think they ever got out of them.

Paignton Zoo was his life and he was a very knowledgeable gardener. He had little interest in people, so he used to come out (he was nocturnal) and work at night in the greenhouses, and often undo what the gardeners had done during the day. He did have a vast collection and Paignton Zoo is now left in trust.

The big collections have long gone, bird gardens replace them. On reflection, the most outstanding aviculturist of the century, must be Jean Delacour.

Debra Bourne M.A., Vet M.B., M.R.C.V.S.

Cranes in Aviculture

We are here to celebrate the fact that the *Avicultural Society*, which has been so kind as to ask me to speak today, has been in existence for 100 years. One hundred years is a fair time, but Cranes have been around for rather longer than this; Sandhill Crane fossils have been found dating back to the time of the dinosaurs. These beautiful, tall, long-lived, graceful birds, pairing for life, with vivacious dancing displays and loud calls have inspired humankind for centuries. In many cultures, especially Japan, they are revered, seen as symbols of good luck, of fidelity, and long life. In past times, Cranes have been kept as pets, as watch-birds, and to be fattened for the pot. In modern times, with half of the fifteen species endangered, Cranes are kept in captivity for breeding: to safeguard flocks against disaster and to restock declining populations. Apart from being worthy of conservation in their own right, they also make excellent "flagship" species, ambassadors for the dwindling wetlands where they feed and breed.

Until two years ago, despite the fact that there were several pairs of Cranes in my father's collection, I had only a passing interest in Cranes. I was more of a mammals person. Then in October 1992, I visited a friend who was working at the International Crane Foundation, Baraboo, Wisconsin. I was there for about five days. By the time I left, I knew I wanted to go back. I spent the summer of 1993 at ICF, and I can safely say that I am now totally besotted by these beautiful birds.

Housing

Cranes can be kept in a variety of pens. The African Crowned Cranes and Demoiselles in particular have frequently been kept in large mixed exhibits, both with other birds and with mammals. For breeding however, it is usual to keep one pair of Cranes in a pen. The pen does not need to be very large, 15 by 15 metres is fine. Pens may be open-topped or flight netted. Open pens require the birds to be feather-clipped, pinioned, or otherwise rendered flightless, and in a high wind a pinioned bird can still jump over ten or twelve foot high netting, especially if the pen is on a slight slope. Flight netting pens is expensive, and impractical with very large pens. It can also be a problem in areas of high snowfall, and there is a theoretical danger of Cranes getting caught in it, although in practice this appears to be very rare. However, in addition to allowing the maintenance of fully-winged pairs, which is advantageous for breeding, especially with the larger species, flight netting provides protection for eggs and chicks from avian predators.

A pair of wild Cranes would have a breeding territory much larger than 15 by 15 metres, hundreds of hectares in some cases. In a captive situation, it helps breeding if the territory is given a visual boundary. ICF uses green tennis court netting in the breeding pens of Crane City. Whipnade uses

wooden panels. Trees and bushes can be planted around the edges of the enclosure for a similar effect.

Most people will provide a shelter for their Cranes, although frequently in a temperate climate it won't be used. However even in Manchester (which isn't that far north) we shut our West African Crowned Cranes in on cold winter nights, to prevent frostbitten toes, and in colder climates the tropical species may require some artificial heat.

Feeding

In the wild, Cranes feed on a variety of foodstuffs such as seeds, tubers, invertebrates, small fish etc. In captivity they are frequently fed a complete pellet food. Since the natural summer breeding time diet contains more animal protein, less vegetable matter, it might be advantageous to feed a lower protein maintenance diet in winter (perhaps 16% or 17%) and a higher protein breeder diet (say 22% to 26%) in spring and summer, with extra calcium. Fish or pinkies can be added to the normal diet as an occasional treat. These can then be used to hide tablets, if necessary and to tempt the appetite of a bird which isn't eating properly. Most Cranes are migratory and their food consumption and weights indicate this, with considerable seasonal variation in appetite and weight.

Health & Handling

Injury and Cranes can involve two things: injury of the Crane, and injury of people by the Crane. Cranes will attack with bill and feet. The former is long in most species, for probing the marshland for food, is under excellent control and will frequently be directed accurately towards the eyes. Especially when dealing with the taller species, goggles are a wise precaution. I say taller species, but there is a report of a Demoiselle Crane killing a human by spearing through the eye. The feet are well armed with claws and can deliver long scratches and deeper gouges to unprotected human legs and arms. Apart from going for the eyes, most Cranes will attack the closest part of the body. A broom or the sole an outstretched foot provide reasonably safe targets for aggression in most instances. Some Cranes however will leap straight over a broom to get at the person behind it, or will attack a broom-wielder more vigorously than an unarmed person.

Cranes can injure their bills, breaking off a portion of the upper or lower half, for instance while trying to escape through, or attack something through, chainlink netting. If it is broken too far up it will not regrow and the bird will be left with an uneven bill; in which case it is necessary to provide a bucket with a deeper than usual depth of food.

A broken wing might occur if a Crane collides with a fence. Slings, splints and surgical repair might allow the wing to heal; amputation is also a possibility and a one-winged bird can do well, although it is a problem for male Cranes at breeding time. A broken leg is a much more serious matter. It is possible to put a bird with a broken leg in a sling for support while it

heals, but Cranes do not tend to respond well to being confined in this way. A Crane with a broken leg is, unfortunately, unlikely to survive.

If a large flight feather is broken while in the blood-feather stage, blood loss from the broken shaft can be considerable. Treatment in this case is to pull out the broken feather, followed by pressure to the skin and feather follicle if necessary. Bleeding from a broken or over-clipped nail or bill tip can usually be stopped by pressure, with or without a styptic such as silver nitrate or potassium permanganate crystals.

Because of the potential for injury to Cranes and people, it is essential when catching Cranes to be as quick as possible. Three or four people might be required to corner a Crane, for an aggressive Crane it may be easier to grab it as it attacks. I like to grasp a Crane by its neck just behind the head with my left hand, and on the upper part of the left wing with my right. Then I can feed the head behind me, gather the body and wings under my right arm and grasp the legs at the hocks in my left hand, keeping one finger between the two legs. The Crane can then be lifted up and, after the legs have been stretched out behind it, it is usually possible to bend them up under the body and hold them with the same hand that is holding the rest of the bird, leaving one hand free. When releasing the Crane, the risk of it injuring itself is greatly reduced if its body is supported until it is properly back on its feet.

It is amazing how loud a response you can get from a metal detector held up to some Cranes. I have personally persuaded a Crane to drop a three-inch long nail rather than swallow it, and then had a race to see which of us could grab the nail first. Although swallowed metal objects will not necessarily harm a Crane, long sharp bits of metal such as nails can cause injuries internally, and lead poisoning can result from lead pellets ground down by stones in the gizzard.

Injury is probably the single largest cause of crane ill-health and death in captivity. Bacterial infections occur sporadically, fungal infections occasionally. Coccidia and worms are a more constant problem, as they tend to build up in pens. On the whole, these do not cause clinical problems in adult Cranes, but they can lead to reduced growth rates, illness and death in chicks. If space allows, which it rarely does, Cranes should be rotated between paddocks, giving each paddock a full year in which the numbers of worm larvae and coccidia will decrease considerably especially in a cold winter. More practically, food for chicks can contain a coccidiostat if coccidia are likely to be a problem and wormers such as Panacur (fenbendazole) can be used to keep worm burdens to a minimum. It is also possible to have worm egg counts done on samples of droppings to give an indication of the level of worm problems.

Infectious diseases are not usually a problem in Cranes. However, in 1978, 20 Cranes in the non-breeder paddock at ICF died of Inclusion Body Disease of Cranes or IBDC for short. This viral disease occurs in wild as

well as captive flocks, and should be checked for in imported birds. The pair of Black-necked Cranes which ICF got from China after several years of negotiation turned out on blood tests to have encountered this virus and possibly still be carrying it. The pair are now in permanent quarantine, always cared for after all the other birds, with overalls, gloves, wellingtons and the use of plenty of disinfectant to ensure the virus is not passed onto other birds. If another pair is used to incubate their eggs, the broody pair is quarantined until the egg has been removed and they have tested clear. Chicks are also raised in quarantine conditions. I should add that none of the chicks or the broody pairs have tested positive to date.

Breeding

Most people keeping Cranes also wish to breed them. Nowadays there are moves to concentrate on the rarer species, which is fine up to a point, although I think it would be a mistake to stop breeding the “easier” species then find that there are suddenly only old pairs left. Not that old age is necessarily a bar to fertility in Cranes. A White-naped Crane, Casey, who died this year at the age of 56 plus, left his young wife and three chicks behind.

Breeding Cranes in captivity presents some problems, or challenges, depending on how you like to look at these things. First, you need one bird of each gender. Not as easy as it sounds since all the species are monomorphic. In each species, male Cranes are, on the whole, bigger than female Cranes. There is an overlap, however. In the wild, pairs always form with a taller male than female, and this is wise to remember for pairing captive birds. In all except African Crowned Cranes, it is possible to tell male and female Cranes apart from the unison call. For instance in most species the males gives a single long note while the female give two shorter calls. Also the male usually moves his head further and lowers or raises his wings further than the female. Modern techniques for surgical sexing and DNA sex identification using blood samples make Crane sexing easier. There is even research on the possibility of sexing Cranes on the basis of steroids in the goop left in the shell after hatching.

Once you are sure you have a male and female, you want to put them together and get fertile eggs. Not so easy. Cranes can be choosy about their mates and, although it is relatively easy to get a semen sample from a male Crane, a female will not usually lay eggs unless she feels herself to be paired.

Sarus Cranes can present a particular problem. Many pairs are known which unison call and guard-call together, dance, show synchronous behaviour, in short, all the signs of a true pair. Put them together, however, and one day the male will scalp the female. No cure has yet been found for this. The only way to get around the problem is to keep the pair separated by a wire fence and use artificial insemination to get fertile eggs.

Not all Cranes are paired with their own species. The Black-necked Crane, Trung Trung, surprised everyone by laying an egg last year. She seems to think she is paired with the female Common Crane next door. One of the reasons for the failure of the Grey's Lake Whooping Crane project, which involved putting Whooping Crane eggs into Sandhill nests in the hope that they would rear them and start off a new Whooping Crane flock, was that Cranes as adults will tend to pair with the species that raised them. In this case that meant Sandhill Cranes. In hand reared birds, humans may become mates of choice, as with George Archibald and the Whooping Crane, Tex. Two Siberian Cranes at ICF at present lay eggs each year after humans spend time dancing with them.

At ICF, possible pairs are chosen based on genetics and on probable compatibility. There is a basic routine for introduction, however the time spent on each part of the process depends on the reactions of the birds concerned. The stages are as follows:-

First, the birds are placed in adjoining pens, but with visual separation by green opaque tennis court netting. Then the netting is removed for at least part of the dividing fence. The Cranes are observed, with the observer in a hide so as not to distract the Cranes. All actions are noted, giving a running record of their behaviour. At the end of the observation period the netting is replaced, until such time as the observation suggests this is no longer necessary. The main behaviours watched for throughout the pairing process are signs of aggression, which could lead to one Crane attacking the other if they are not separated rapidly, and behaviours suggesting pairing, which include performing similar activities close together and at the same time as each other (synchronous behaviour) as well as more obvious unison calling or guard calling together. Some aggressive behaviours such as bow threats and drop wing threats are obviously aggressive. Others are less obvious; a threat walk can easily shade into the more upright display walk. A Crane which at first glance as you stop to look at it appears to be preening, may actually be threatening, with its attention not on its feathers but on you.

After the birds have been in visual contact with each other, one bird is introduced into the other's pen. In most cases the male is put into the female's territory. This can be reversed, for instance if the female is quite a dominant bird, or the male is nervous and overly affected by being driven. Again, the birds are watched closely from a hide, close enough that the observer can quickly intervene if there is aggressive behaviour. It is very important to have a good feel for the birds, to know how much aggressive interaction is allowable and when the birds should be parted. After about an hour, if all has gone well, the birds are separated. The introduction is repeated daily, using the same observer each time. When there are good indications of pairing, or at least the observer is fairly certain the birds will not attack one

another, they can be left together with just a check every so often. Initially, this may mean being left for one or two hours working up to left together all day. Finally they are no longer separated at night.

One pair of Whooping Cranes I worked with were unison calling right from the start and were left together permanently 2 weeks after being put into adjacent pens. Another pair, White-naped Cranes, took nearly three months of work. In both cases, the pairings were successful, with eggs and chicks this year.

Most Cranes are seasonal breeders and day length appears to be an important breeding cue. In fact, for some far-north breeding species, such as Siberian Cranes, it appears essential to artificially lengthen the day with floodlights mimicking the midnight sun. For Brolgas, artificial monsoon showers seem to be helpful.

Even if you have a good pair, and are getting eggs laid, fertility can still be a problem. Reasons for poor fertility include physical difficulties in mating, due to toe or wing problems as well as poor semen quality. In addition, you have those Sarus pairs who just can't be left together, all-female pairs and birds imprinted on the wrong species. In all these cases, artificial insemination is invaluable. This esoteric skill is not difficult to master with good instruction and a little practice. It is, however, hard to describe properly, but I'll try. First, you catch your male Crane and hold him standing with his head and neck sticking out behind you and his wings between your arms and legs, while stroking up and down his thighs with your hands. With luck, he relaxes, raises his tail, and purrs. The second person then comes and massages the cloaca from all sides in a kind of milking action, then the semen, usually 0.03 to 0.15 ml, is collected by running a smooth-lipped glass up the outside of the cloaca.

The semen is then drawn up into a 1 ml syringe and diluted with semen extender, or just physiological saline. For insemination of the female, the bird is held as before, but the back and sides are stroked. The syringe is placed into the cloaca, and preferably into the oviduct. This is the part of the process which takes most practice to get right. The semen is slowly injected and the syringe withdrawn. At Baraboo, optimum results have been obtained from inseminating three times a week and immediately after an egg has been laid, although there has also been success from a single insemination after the first egg of a two-egg clutch has been laid, gaining a fertile second egg. This approach may be best with nervous birds which are likely to be disturbed too much to lay if subjected to repeated A.I.

In the wild, Cranes would lay a clutch of two eggs (more for the African Crowned Cranes) and rear one or two chicks, depending on the species and food availability. In captivity, it is often possible to increase this productivity rate by removing clutches for incubation artificially or by other birds, with

the Cranes then hopefully laying again. Some Cranes will lay a dozen or more eggs a year with this method. This has been extremely important with Whooping Cranes and Siberian Cranes. The problem with the extras is, who will rear them? Letting Cranes of another species rear chicks results in birds, especially females, attracted to the wrong species later in life. Hand rearing also presents some difficulties.

In a book on incubation, I once read a suggestion that all pheasant chicks are suicidal. Having reared pheasants, I would agree. With Cranes, the problem is more that they are siblicidal. Most of the species lay two eggs and frequently hatch two chicks, but often only one, usually the older, survives. In the species which do rear two chicks, this is usually achieved by keeping the young chicks apart, one with each parent. When hand rearing, the tendency poses a dilemma. In order to rear Cranes which know they are Cranes, they should have plenty of contact with their compatriots. Give them this contact and they will make spirited attempts to kill one another. A partial solution is to allow visual contact through perspex walls. Even this has to be discontinued if the chicks spend so much of their time trying to attack one another that they have not time or energy left for other activities, such as eating. If you only have one chick, a mirror can be provided so it thinks it is seeing another chick.

Feeding can be encouraged initially by offering dampened food on a red spoon held in an artificial crane head. It has been suggested in the past that chicks should only be offered food after they are a day or two old, to ensure proper yolk sac absorption, but it has now been shown that feeding in the first day leads to no ill effects.

Crane chicks grow at amazing rate. They can gain an inch in height in a day, and can put on 25% of their body weight in a day, although 10 - 15% is a more sensible level of weight gain. It is because of this rapid growth that exercise is very important. In the wild, chicks would be following their parents for many hours each day. Hand rearing is most unlikely to manage that, but exercise must be encouraged, if chicks are to grow with strong straight bones. Whooping Crane chicks seem to be especially prone to leg and toe problems, which may be related to their small genetic base, given that the species has been built up from the low of 22 individuals in 1941, and probably only about 14 genetically. Crooked toes can be splintered for a few days to encourage straight growth.

At Baraboo, chicks are exercised as a group in a large yard. The (human) chick parent on duty in the yard encourages the chicks to feed and exercise and breaks up fights. Since young chicks are more pugnacious than older ones, there is sometimes the funny sight of a small chick in vigorous pursuit of a much bigger target, which can turn tragic if the large chick decides to peck back. There is in the yard a "penalty box" which can be used to confine

a chick which is too aggressive for a while, or give safety to one which is overly nervous.

If birds are meant for release, parent reared birds are best. Next best is to isolation rear the chicks. This involves the human chick parent only appearing dressed in disguising robes and hood, and with a glove-puppet "head" on one hand. The chick doesn't hear human voices but only tape recorded brood calls. Chicks raised this way have been included in the experimental release of Whooping Cranes in Florida, although as they are only two years old it is too soon to say whether they will pair up successfully.

The noted American conservationist, Aldo Leopold said of Cranes that they lie beyond the pretty and beautiful, in values "as yet beyond the reach of words".

I won't be present when the *Avicultural Society* holds its Bicentennial meeting. However, I can take some small satisfaction from knowing that my efforts along with those of the Crane TAG in this country and many other aviculturists all over the world, help to ensure that all fifteen species of Cranes will still be around one hundred years from now.

Mike Reynolds - Parrots

It is a great privilege to be here today. I have been a member of the *Avicultural Society* for quite a few years and I believe that resulted from my wife making a deal with Raymond Sawyer that if he would join the World Parrot Trust we would join the *Avicultural Society*. It is nice to be here today and to be given a rather broad target in that I was asked to speak about 'Parrots'. That certainly is a very rangy type of target.

The thing about Parrots is that they are special. They are special to us humans because they have so much going for them. They have beauty, colour, variety, are long lived, have this ability to speak up to a point and they have a particular fascination. I believe they have more intelligence than any other bird that I have become acquainted with, and I say that despite being extremely fond of Cranes. Cranes are wonderful birds and are probably number two in my personal list of birds, but Parrots have undoubtedly got something extra. That is measured by the worst possible human measure, money.

There aren't many birds that I am particularly aware of that have become so closely associated with financial considerations and that is a complete disaster for the Parrots. I will come back to that later on. What I would like to do is just mention some of the birds that we have had experience of at Paradise Park in Cornwall. For those who don't know, this is a Bird Park that was started in 1973, by my wife and myself. Over the years we have kept some fairly interesting, particularly Appendix 1 birds that we always sought out on the principal that if you are going to go to the trouble of keeping birds, you might as well keep birds that might hopefully benefit

from it in the long run, and that need attention. I would like to mention some of the Parrots that we had particularly close and long lasting experiences with over the years at Paradise Park.

I shall start with Scarlet Macaws. When I first started keeping birds about 25 years ago, after leaving the advertising business, I was working from home. I then started keeping one or two birds and it developed into keeping Parrots. I wasn't really made captive until I saw a free flying Scarlet Macaw, and after that everything else seemed to fall into place. It did rather lead to moving to Cornwall, finding a suitable property and getting on with setting up our very modest Bird Park.

We have a Scarlet Macaw called Alice. She was with us in 1972, and we paired her up with a bird called Mac, and for twenty years they flew free around our Park. They loved rain bathing. They had their favourite trees and for some reason they were always fascinated by a circular window. One particular time of year, I think October, they would go and sit in there quite a bit. What the significance of that was I could never figure out. They loved their morning biscuit given from our bedroom window. As a matter of fact they did this for literally twenty years. In the meantime they were busy breeding. My records show that over the full period that these two were paired up, they produced no less than 55 young Scarlet Macaws. Now in the early years, the 1970's, we would simply leave them to lay their clutch, and let them raise them themselves, which they did with great efficiency. They had two barrels, on a flat roof, one for roosting, and one for nesting. On several occasions, we allowed the chicks to fledge with their parents, and the sight of four Scarlet Macaws, just flying around above our place in Cornwall was quite something. The only time it went wrong, was when they had a clutch of three. They fledged and went through the usual rather alarming processes of crash landing in trees for about three days. We knew there was an element of risk in this enterprise, but on this occasion after about five days one of them simply disappeared. We assumed it came to grief possibly perched too low and was caught by a fox or something like that. Nonetheless they probably are the most productive pair of Scarlet Macaws that ever lived, although I am not too sure about some of the parrot factories that are now developing in the USA.

After the 1970's we started to take the first clutch and hand rear them and that's how we got into such high numbers that were produced by this one pair of birds. They really have the full run of the place, and only rarely did we ever keep them in. If we had a particularly hard spell in the winter, then we would catch them up and bring them in. Their favourite perching place was a copper beech which they chewed up a bit. Actually before I come to the end of the story about these birds, that tree is now virtually recovered because they were grounded for two years. What happened in the end was that "Mac" developed cataracts, first on one eye and then on the

other. He really couldn't see at all. The interesting thing was his mate would come and land on our bedroom window and she would be making little calls and he would be hovering and homing in to land beside her. I must say this always struck as an incredible piece of bonding, if you like, a demonstration of the very serious and complete bond that you get with Parrots, certainly the larger ones. What's happened more recently is that we had to ground the pair of them and put them in an aviary, which was quite a large one. Mac didn't like it and he went into a considerable decline and died.

After re-pairing, Alice was a very amenable girl. There were complications with that, so we re-paired her with a bird we called Mac 2, and they were released in March this year. We didn't clip Mac 2's wings, we just let him go with Alice. She had been away from her roof top barrels for 2 years but she immediately flew to the copper beech tree and he followed her. She was showing him around. Unfortunately the story doesn't end perfectly, because they have laid three clutches of two eggs this year and all have been infertile. We are hoping they will be in better shape next year, perhaps when the male has had a lot more exercise and got himself in better shape.

The other thing that Alice did in 1977, was that she reared our first Buffon's Macaw. We had a pair of Buffon's where the male was intent on squashing the eggs. So we took a fertile egg and gave it to Alice and she hatched and reared this chick, with no trouble at all. We did actually get chicks reared by the Buffon's, and we did it by this method. We realised the male was considerably bulkier than the female, so we made an iron ring that we fitted over the entrance into the nesting barrel. We had to make two or three before we got it right. Eventually we had a situation where the female could just squeeze in and the male couldn't. We saw his eyes popping out trying to get in there, so as to sit on the eggs. Eventually they did rear two, but Alice the Scarlet Macaw reared our first one, and accordingly to Rosemary Low, it was probably the second breeding of the species world-wide. I think she identified a first breeding in East Germany in 1968. So Buffon's have always been very important to us. We used to photograph Alice's chick weekly but she didn't like this. This bird is still with us and in fact he reared a chick this year, and three last year so it's been a good interesting species for Paradise Park. Actually the first chick we took away at 10 weeks, and finished him off by hand rearing. He really is an excellent bird.

Leadbeater's Cockatoos are birds that always appeal to us a great deal, and we have bred a fair number. I originally had a pair from Newton Steel who I am sure some people will remember from South Devon. It's a pair that is still with us and still producing young.

We bred some Thick-billed Parrots in the early years. Ken Dolton bred some one year and we came along and produced some the next year. Unfortunately we have not bred any since 1984. I'd like to tell you that this

maroon-fronted parrot is currently with us in Cornwall, but unfortunately it is not. A Mexican vet got in touch with us. He persuaded me to go to Monterrey, North East Mexico. I went to the place where these birds live which is a very dramatic place. They nest in cliffs and we saw a flock of about 30 or so swirling all around on the face of the cliff with a tremendous noise coming from the wings, something I had not noticed before. It was quite an experience. This is a species that is very endangered and according to our friend in Mexico, there are not more than 600. There is a kind of disagreement going on between him and other scientists who say there are 3,000.

We have had some success with Keas over the years and I suppose we must have produced upwards of forty. I think we have got about 5 of them this year. They are wonderful birds. The first clutch were parent reared. I think we just pulled them from an underground cave, to get a photograph, and then rapidly stuck them back again. They all did well. Then we started hand rearing them and we now have two very productive pairs, and get quite a lot of eggs from them. Unfortunately, we don't rear all the chicks. We get some mysterious losses that we can't put our finger on. Nevertheless, we have averaged about 6 young each year for the last few years.

I would like to tell you we are awash with Hyacinth Macaws, but it just isn't true. We have struggled with these birds for twenty years, having had about 8 fertile eggs but they have always succumbed at the point of hatching. Why we get it wrong all the time I don't know. It is a magnificent bird to work with. There is a lady who I met in the States who has just written an article for our World Parrot Trust Newsletter. She bought one pair of Hyacinth Macaws about 3 years ago, and she has produced 21 young. So it is a puzzling bird. The Umbrella Cockatoo, Susie, was my personal pet for perhaps 10 years, and then we turned her into a breeding bird. She used to produce 4 chicks a year without any problems at all. I am very sorry to say she was stolen from us along with 20 other birds in October 1992, and we have never got them back.

I had better move on to the World Parrot Trust, because this is something that we started in 1989. I first thought about 10 years previously that there ought to be a Trust working specifically for the Parrots. If you look at the work that has been done by the International Crane Foundation, the World Pheasant Association, and the Wildfowl Trust, it is illogical that there shouldn't be a Trust working just for the Parrot. I discussed this idea many years ago with Peter Paris. Probably it was a good thing at the time that he talked me out of it. Eventually in 1989 we launched this charity which has the principle aim to help the survival of Parrot species in the wild. It's also concerned with the welfare of every individual Parrot whether it is in the wild, is in transit, being traded or living as a pet or whatever. We gave ourselves quite a broad task. We have had placed a notice board at about 20

Zoos in the UK and one or two places overseas. We have just managed to get one in at Parrot Jungle, Miami. Perhaps I should give you a very quick run down on some statistics. The Trust has 2,000 members, it's raised nearly £500,000 in five years and that money is not tucked away to guarantee everybody pensions, which I think happens with some bird organisations. It gets spent, and so we are constantly locating projects that need funds. We go out and spend it. It is a kind of continuous cycle.

The first thing we got involved in was the Echo Parakeet on Mauritius. We met up with Carl Jones and asked if there was anything we could do to help his work. He said "Yes, get me a new four wheel drive vehicle". If you meet anyone who is doing any sort of conservation work, they think you might be good for a few bob. His landrover badly needed replacing and we somehow raised £10,000 including a contribution of £2,500 from the Parrot Society.

On Mauritius young Echo Parakeets are being reared. Tim Lovegrove is a New Zealander who has done a lot of work with Don Merton on the Kakapo and many other enterprises. We funded Tim's going for six months to join the team working there. He is a tremendous expert on things like poisoning rodents which were a continual threat to the Echo Parakeet. Line Wadam is one of our two World Parrot Trust organisers in Denmark. She wanted to go and gain some experience. She went there, and made a very valuable contribution.

What happens is we find a project, and give it some assistance. We let people know we are helping, and hopefully we get more funding to help the thing go a little further. It is a continuous process. The notice board is to give the general public a picture of what is going on and why the Parrots need our help. One of the things we did fairly early on, was to buy a bus which is called The Jacquot Express. The basic idea came from Paul Butler of RARE, who I met up with at one of the Parrot Conferences that go on. He was bemoaning the fact that he had this marvellous idea, but it was too expensive. He was proposing to buy a new Mercedes bus, which when he thought about it needed to be short so it would get around the roads in the Caribbean Islands. I found one in Cornwall. They sadly have all gone now, those little 24ft busses. I managed to buy one for £1,500. We had to spend a bit to do it up, but being a public service vehicle, it wasn't in too bad shape. Then we created the exhibits to go in it. The first bus went to St Lucia, and then others were sent to Dominica and St Vincent.

We fortunately have an artist local to us in Cornwall who was able to paint the bus exteriors with all kinds of exuberant stuff. I must say it goes down a treat in the Caribbean. In the interior the bus has a TV Video set and in the back a couple of working models which show a good rain forest and a bad one. What happens is you press a button and it rains. In the good rain forest the water gets properly filtered and comes out as pure water. In

the bad rain forest, where you can see the forest is virtually cut down, bananas are creeping up the hillside and roofs fallen in on the houses, the water which comes through it, looks as if it has met a tea bag on the way and comes out rather murky. I've tried to make the point that it is not just for the benefit of the Parrots, it's for the benefit of the people that the forests are preserved. This message has been very well received to the extent that we now have been commissioned to do a similar bus for Paraguay. The British Ambassador came to our place and saw some information about these buses two years ago. He has been pursuing this ever since and he has even extracted money from the Foreign Office to buy the bus. We have just extracted another sum to do the interiors. These buses have been quite a success.

On St. Vincent we gave some funds to assist the breeding facility they have there. It has been quite successful. I think they have bred 13 or 14 chicks in the last four years or so. Fitzroy Springer is in charge of the aviaries. He's been to Jersey and he has been to spend a couple of weeks with us in Cornwall. I think he knows all the young birds that he's got there. We sent Andrew Greenwood over there recently to do a report on the aviaries and the whole future of the programme. There seems to be some uncertainty about why they maintain these birds in the aviaries and why they are breeding them. They don't want to send them out of the Island. There are a whole load of problems to be resolved and various people are working on that now.

One interesting fact (I am told it's a fact), is that Ramon Noegel who has bred a lot of these birds in Florida has apparently just sold the whole lot to Bernie Levine of Parrot Jungle for allegedly \$1,000,000. So I think you are going to find a lot of very commercial St Vincent Amazons emerging as time goes by.

Paul Butler came to visit us. One of the reasons we have been so interested in St Vincent Amazon is that the government sent us a pair in 1974. It took us till 1990 before we finally bred one. We are asking the authorities on St Vincent to let us have a male, as they have surplus males on the Island, to pair up with the female we have bred. We are waiting to hear. The only other thing about the St Vincent Amazon, is that we have hatched another one a month ago. We are making progress, but it is painfully slow.

In 1990 we launched the Hyacinth Fund, wanting to make use of this bird as a flag ship species. We raised reasonable funds, but nothing spectacular. It enabled us to support some of the work being masterminded by Charlie Munn who is probably the world's leading Macaw researcher. He spent about 18 years in Peru, Bolivia and Brazil studying Macaws and particularly in recent years he has dealt with the value Macaws have as a contributor to ecotourism. We were able to contribute towards this work and also in particular funded the additional nest boxes which were something

that was found to be necessary. That was in the Pantanal. It appears there is intense competition for the nest trees in that locality.

For Lear's Macaw, we used some of the funds we had in the Hyacinth Fund to begin working with this species. It is a very tricky situation. These birds depend for the majority of their food on the Licuri Palm, and it had been chewed up by cattle and goats. They are flying farther and farther afield sometimes as far as 100km in a day, when they have chicks. So we identified the task of planting substantial new quantities of these palms in localities nearer to the birds breeding and roosting areas. That's a programme we have underway, because those are the palm nuts they rely on. I have to say that the most recent information I have is encouraging. Whereas before we thought there were no more than 60 Lear's Macaws I now have a report of 118. That's the latest official total from Brazil. There's a flock of 90 which is apparently flying around and raiding maize fields. They had a tremendous drought for several years, but they had excellent rains last year. So the crops are good, but the Macaws are putting themselves at risk by attacking the farmers' crops. Where they live and breed, they find crevices in rocks, to make their nests.

I went to visit Nelson Kawanishi in Sao Paulo who has amongst other things Spix's Macaws and one Lear's Macaw. We were trying to manoeuvre this bird to get a decent photograph, but it decided to play dead. It was quite alarming at the time. Nobody knows the history of this bird but presumably in some previous existence it has been trained to roll over and play dead. It's very sad really as this is a female, there is a female at Sao Paulo Zoo and Harry Sissen has a male that is very old. I think he has a female still, and there are two females I have also visited and photographed in Busch Gardens, Tampa, Florida.

Regarding the Spix's Macaw in the wild. One of the things we did was to part-fund an expedition which went to establish how many were left. It was hoped there were either three or five, but they only found one. That bird is still there, and several years on there are still people talking about putting a bird out there to join him. I'm afraid it looks as if it is going to be a while before this talking is turned into action. Perhaps we will learn more later this month at the Loro Parque Conference.

The Spix's Macaw is exhibited at Sao Paulo Zoo. They have a pair there that were confiscated and found in the hands of a dealer from Paraguay. A very good potential breeding situation but they have showed no signs at present. Other people have bred them in captivity.

A situation we got involved in, and we really shouldn't have, was where there were several hundred Goffin's Cockatoos being held by a trader in the Tanimbar Islands. It is a stronghold of this species. We went to a lot of trouble to get them released with government approval. Frankly not all of them could fly but they eventually released 319. My guess would be that

maybe 200 would have made it back into the forest. They had been blood tested to finally ensure that they were not carrying any diseases. All in all it wasn't a very sensible thing for us to get into. We felt it was a welfare issue and we should try to do something. The bird had just been put out on Appendix 1. We also contributed to a survey by Bird Life International which shows there are 400,000 Goffin's Cockatoos on Tanimbar. So it is possible they may now be taken off Appendix 1.

Quickly to Australia where we have a project going involving the Red-tailed Black Cockatoo, not the one that is rather numerous but an endangered sub-species called *Calyptorhynchus banksii graptogyne* which means 'beautiful woman'. The females have more colour than those of the nominate race, with speckles around the face. There are maybe no more than 500 or 1,000 of these left in a corner of Victoria and South Australia. We asked Joe Forshaw if he could find us a good project in Australia and he came up with that. We supported it for three years and are committed to supporting it for another 3 years.

We had a remarkable day down there when we went out with Joe Forshaw, Bill Emerson, who is in charge of this programme, a local MP, press and TV. We went in one of those cherry picking vehicles. We got up and looked into some of the nests that they were supervising. There is a danger of these birds being stolen. There is a farmer who we pay for a certain period of the year to check and protect the nests.

Martin Ballam has been with us at Paradise Park for a number of years. Over the last 5 years since we started the World Parrot Trust he has been doing flying demonstrations with Eagles and other birds as well. He has actually raised as of about 2 weeks ago £70,000! In the middle of his demonstrations he stops and gives people the most amazing description of the work of the World Parrot Trust and asks them to empty their pockets into a collecting box on their way out. He is pretty ruthless and he has raised all that money.

If I could close by suggesting that if you have the privilege of enjoying the Parrots in your aviaries, then I do think it is entirely natural for me to suggest that if you enjoy these birds in captivity, then you have a certain responsibility for them, not just in captivity, but also in the wild. After five years of working on the World Parrot Trust, this is the essence of the message that we have. We find that the vast majority of the funds we get come from aviculture, but probably it is true to say 95% of the people involved in Parrot aviculture don't think beyond their back yards. We have a considerable task to make people understand that they have this responsibility for parrot conservation.

Dr R Wilkinson**First Breedings at Chester Zoo**

Chester Zoo has a long association with the *Avicultural Society*, firstly through its founder Mr George Mottershead. Coincidentally 1994 is the centenary of the *Avicultural Society* and also the Diamond Jubilee of Chester Zoo. It is an honour to be asked to speak today at the *Avicultural Society* Centenary as this is such a distinguished Society. It is an important Society in many ways, not least because of the *Avicultural Magazine*, which has brought aviculture into the fold of ornithology. I think this is a very important achievement for the Society.

Some of the other important aspects of the Society include the social functions. People get together getting to know each other and to trust each other. Trust is important because we have got to start working together for aviculture and to start co-operating for aviculture. We can't afford to think of ourselves as single little entities.

I was asked to talk about first breeding successes at Chester Zoo. Success is often very short lived, and that is going to be one of the themes for this particular talk.

First breedings are fun, they are educational, but they are only a beginning. We have had our good share at Chester especially in the last 30 years. It has been great to have them, but you have got to ask the question, "where do you go from there?" We have looked back at the last 100 years in this morning's contributions. We have got to look forward to the next 100 years and make sure we still have those birds we need to continue in aviculture.

There has been a great resurgence of trade recently - but how long will it last? What I really want to point out today is, as we go through some first breeding successes, is where so many of them have faltered later. I don't think this is just true for Chester Zoo. It is true for most aviculturist's and most zoos. What as a Society do you think we should do?

The *Avicultural Society* gives awards for first breedings; medals for its individual members and certificates for zoos. Perhaps we should find some way of recognising those aviculturists who have achieved sustained breedings and have worked hard for aviculture. We haven't really found a way of recognising those particular members, but we all know them, and I think it is very important to reward them. Some of us are more privileged than others. We may for example have the finances to buy rare birds which have not previously been bred. Others have privileges, as indeed has Chester Zoo, of working with zoos abroad and to import new species from them to obtain first breedings. But what we really should be looking at is not a first breeding, or even second breedings but sustained breedings over generations. This is something that the *Avicultural Society* needs to address within the next decade, perhaps even in the new few years.

George Mottershead was the founder and first director of Chester Zoo. George Mottershead's first letter for the *Avicultural Magazine* was about a white Swallow he had seen passing over the zoo. The *Avicultural Society* is not just concerned with birds in captivity. From its inception it has been dedicated to the study of foreign and British birds in captivity and in the wild. The first "first breeding" reported from Chester Zoo by George Mottershead was that of a Griffon Vulture bred at Chester in 1940. This was a very important breeding success.

The next success that Chester Zoo was credited with was in 1966 with Sclater's Crested Curassow (now more commonly known as the Bare-faced Curassow). Since they were first bred in 1966 more than 40 Bare-faced Curassows bred at Chester Zoo have been sent on loan, many to zoos abroad; the farthest being Ueno Zoo in Japan.

Pallas's Sandgrouse is one of the breedings during my period of curatorship which was very exciting. We received five captive-bred Pallas's Sandgrouse from Rotterdam Zoo, with which Chester has had a long association. I believe this is very important because quite a number of birds are worked with at both zoos. Two chicks were reared from four hatched in 1985 and another chick reared in 1986; but after that we started having problems in hatching eggs. Some birds were moved to Paignton Zoo but four years later the whole population had died out. It wasn't enough just to have had the four or five birds to start with. There were no other birds in the country. The five birds we started with were all siblings so inbreeding may have been a problem.

I didn't know that Chester Zoo was credited with the first breeding of Pied Imperial Pigeons until I looked through Dave Coles' very useful little book "First Breeding Records". That first breeding had been credited to Chester from one bred, presumably in the large Tropical House, in 1964. Since then the species has been represented at Chester Zoo for many years and we have recently received two pairs of captive bred birds from Paignton Zoo.

Chester is well known for its Musk Lorikeets. Again four birds arrived originally from Rotterdam Zoo in 1986. Although chicks were hatched in 1987 these didn't survive. Between 1988 - 1991 a number of birds were hatched of which six were reared. Following a number of losses, we were then left with four females. At that time, there were no other birds in England. Subsequently some were imported into the UK by Rex Merritt but we then had already agreed to return our four females to Rotterdam, where they had unpaired males.

We have worked for a long time with Lesser Patagonian Conures at Chester. Chester was credited with the first breeding in 1971. W R Partridge bred Patagonian Conures in 1963 but these were then reported as Greater Patagonian Conures. In 1967 a pair of Lesser Patagonian Conures were

purchased by Chester Zoo from Harry Liptrott, who some of you may remember had his premises by Marton Mere near Blackpool. Three chicks were hatched in 1971 as reported by the then Curator of Birds, Bill Timmis in the *Avicultural Magazine*. Going through our records I discovered that ninety-nine Lesser Patagonian Conures had been bred at Chester most of which had been sent to other collections. More recently Chester received a Zoo Federation award for meritorious breeding of Lesser Patagonian Conures sustained over a number of generations.

Our colony of Lesser Patagonian Conures produced yellow birds over the years. They had dark eyes and were not lutinos although it appeared at first that this was a sex-linked mutation. It now appears that it might have been a simple recessive. It is zoo conservation policy not to selectively breed from mutations. As such we felt it was better and more appropriate to allow these mutations to go into private aviculture. Three different people have received this mutation and presently Harry Sisson has two or three of these yellow birds plus their surviving relatives. We no longer hold Lesser Patagonian Conures at Chester but are hoping that soon we may start working with the Greater Patagonian Conure which is a more endangered sub-species. We received a bird from Antwerp which has now been paired at the Tropical Bird Gardens, Rode. We hope that with good co-operation the Greater Patagonian Conures may be established in the same way Lesser Patagonian Conures have.

Crimson-bellied Conures were bred at Chester in 1976. These birds again came from Rotterdam Zoo; three were bred in 1976 and three more in 1977. Two were sent to a private breeder and a single death was recorded in 1977. No more breedings were subsequently reported from our stock which were then two males and one female. These were returned in 1983 to Rotterdam Zoo, who successfully continue to breed this conure. Recently we were offered some back but had to decline because of lack of space for this attractive but non-endangered parrot.

Another species for which we were awarded a first breeding in 1981 was the Slender-bellied Conure. A pair was purchased in 1978 then a second pair in 1980. No breedings took place until 1981 when four chicks were hatched of which three were reared. In 1983 both pairs bred producing a total of eleven youngsters. In 1985 we had another six hatch of which four were reared. In the first years everybody wanted our youngsters but later nobody was really concerned. This is a difficulty we have found for many different species. When you first start breeding a species that has previously been rare in aviculture then everybody wants to work with it. Very soon there are about 10 or 12 pairs about in different collections and then interest soon wanes. Chester is still working with Slender-billed Conures, having bred four this year. To date we have bred nearly thirty of this species.

Continuing with Parrots for which, to date, Chester has a good reputation, we had a first breeding in 1985 for Lesser Vasa Parrots. Our original pair came over from Switzerland. This was arranged by Peter James, who was assistant Curator of Birds at the time. At that time Lesser Vasa Parrots were an avicultural rarity. A couple of years later, large imports arrived into the UK and the market was flooded but still very few people bred them. I think now you can count on the fingers of one hand the number of people who have bred Lesser Vasa Parrots. To date Chester has reared 23 chicks, not including several still in the nest this year.

Greater Vasa Parrots are one of my favourite parrots. We started working with these after having had successes with the Lesser Vasa Parrots. We first reared Greater Vasa chicks in 1990 and subsequently have had chicks every year since giving a total (including four chicks this year which have just left the nest) of 17 birds. Again we have the same problem. How many people are breeding Greater Vasas? Ken Dolton is, but how many others? The answer is very few. Even now I am listing them on the Zoo's surplus list but nobody inquires for them.

This highlights another problem that we have to face, the disposal of the surplus birds we breed. I know we all use dealers when necessary but we don't know where the birds end up. We spend a lot of time breeding birds and working hard with them so we don't want them to end up in totally unsuitable accommodation. Within the *Avicultural Society* we should work together to a greater extent in the future to move birds around amongst our members.

Fire-tufted Barbets were another first breeding at Chester. The barbets were great to work with. They used to chisel out an old nest-log that had been put there initially for White Woodpeckers, which we were breeding at that time. We learnt a lot from working with these birds. Like some toucans we found that in some pairs of barbets either the male or female would suddenly become aggressive during the breeding period. During the time there were still chicks in the nest we had to be very careful because we often didn't know which way to go, and had to be ready to pull either the male or female out or else we would lose one or the other. However, by working with them skilfully our keepers managed to rear quite a few of them at that time. Again we had the problem that nobody else was working with them at that time. We sent young barbets to various other collections including London Zoo where I believe at least one of the birds still remains.

Having gained some experience with Fire-tufted Barbets and also with breeding Crimson-rumped Toucanets, we decided that we would try one of the larger toucans. We purchased a pair of Channel-billed Toucans from "Ravensden" in 1984 and first bred them in 1989. We have reared 15 youngsters to date. We kept back the first female that we bred in 1989 and purchased a wild caught male for her. We are hoping to soon start breeding

from this second pair. They are looking good this year, having been in and out of the box a few times. It has taken a long time but until we can actually get to second-generation we can't really claim to have been successful with Channel-billed Toucans. We have been successful in breeding from one pair consistently but that is not going to keep the species going in aviculture.

We first hatched African Grey Hornbills in 1988 and 20 chicks have been reared since. Their offspring have been sent to various collections but how many of them are now breeding? The majority of birds that are now available are related to Chester's which creates another problem. Clearly it would have been better to have started with a larger founder population.

Two Trumpeter Hornbills were reared in 1989, again a UK first breeding. Since then we have reared a total of 13. Again young have been sent to Harewood, Paignton, Banham Zoo, Walsrode and quite a number of private collections. Trumpeter Hornbills should have a future because four or five other zoos are now breeding them. If the interest is retained these could be established unless another species comes along and displaces it.

Another first for Chester was with Red-headed Laughing Thrushes. There is now a lot of interest in Laughing Thrushes. The Passerine Taxon Advisory Group have concentrated on these with Dave Coles, a Laughing Thrush specialist running various stud-books. Chester first bred Red-headed Laughing Thrushes in 1974, and then bred them for some years subsequently. 1983 was our last breeding. By 1986 we still had the parents of the previous youngsters but they failed to breed from 1983 to 1985. Padstow who had some successes with Red-headed Laughing Thrushes were sent these birds in 1986. Unfortunately, Padstow has now closed.

Shortly after arrival at the zoo, Wagler's Oropendolas bred in the Tropical House in 1982. Only the one chick ever fledged. The colony of ten birds then dwindled and finally died out in 1990. I wonder whether releasing a pair of Giant Cowbirds in the Tropical House, which in the wild are brood-parasites of Oropendolas, may have disturbed the Oropendolas when breeding? However, there was no obvious evidence of harassment or pressures from the cowbirds and in the wild cowbirds, unlike cuckoos, are reared together with the host young.

The Baya Weaver was bred in 1980, I believe in our Finch Flight. These were transferred to the Tropical House in 1984, but the last of the survivors escaped when the roof was damaged in 1990.

First bred in 1989 the Taveta Golden Weavers were received as Golden Palm Weavers but later re-identified. These bred in the free flight of the Tropical House. In 1989 we fledged six Taveta Golden Weavers from one breeding female. That breeding female then died, disappeared or escaped so ending this story. We have now half a dozen males but where can we find a female Taveta Weaver? It is going to be terribly difficult to find mates for the males.

Also in the Tropical House, White-headed Buffalo Weavers bred successfully in 1989. White-headed Buffalo Weavers built a huge nest of 2' to 2' 6" diameter like a huge ball in the top of a palm tree. The nest had a number of openings and I suspect we had two or three different females breeding in this nest, each with different chambers. More recently, Pied Imperial Pigeons dismantled the whole nest so ending the breeding of the White-headed Buffalo Weavers.

Long-tailed Glossy Starlings have always been favourites of mine. I worked for six years in Nigeria where these birds live. It is a very difficult bird to study in the wild. I spent hours trying to find their nests to be able to study their behaviour. I never succeeded. Then when I came to Chester Zoo we bred them in the Tropical House and I was able to document previously unknown aspects of their breeding biology. The first breeding of Long-tailed Glossy Starlings at Chester had occurred 10 years before but had not been documented. With this new information we were able to claim another first breeding for Chester.

Geoff Masson from Paulton Park loaned Chester a pair of Ashy Starlings which were causing trouble in his mixed aviary. We received them in 1988, and in 1989 had the first breeding. We bred from this pair on two occasions, but then the male died. The youngsters were both females and with no other Ashy Starlings in the country this ended our breeding history. We thought we would be better prepared next time. African Pied Starlings had always interested me and in 1991 we imported six birds from Tygerberg Zoo, South Africa. After quarantine all six were released in the free flight in the Tropical House. We started having problems when these proved susceptible to gapeworms. Our first successful breeding was in 1992 after several previously unsuccessful breeding attempts. However in 1993, even though we had started with six birds, we were left with only two females.

San Blas Jays present a similar story. After our first breeding in 1976, we were very successful for a few years. We then had problems again with gapeworm. We had to take chicks from the nest at about a week old and finish them off by hand-rearing to avoid infection.

The best of Chester Zoo's bird breeding successes was in 1968 when the Superb Birds of Paradise bred. Bill Timmis reported this breeding in the *Avicultural Magazine*. 1968 was the same year that Princess Stephanie's *Astrapia* was bred at London Zoo. I think these were the only two breedings of Birds of Paradise in this country. It's sad considering how many came in. Wouldn't it be wonderful to have those now? I'd love to be able to work with them.

Our most recent first breeding, for which we have to thank Taronga Zoo, Sydney, is that of the Tawny Frogmouth. We received four birds from Taronga in 1981. Two of these died in the first year leaving us two males. We then

worked hard to try and find females for them. Despite various promises nothing ever materialised. Eventually in 1993 we received two hand-reared females from Taronga. We had a lot of trouble getting the females together with the males but eventually succeeded. Both pairs laid this year but only one was fertile. From this pair the first clutch disappeared at the end of incubation, just as we were expecting them to hatch. We suspect the chick might have been eaten but we never knew as we didn't find any evidence. So the second clutch of two eggs were taken away and put into the incubator. One chick hatched, an incredible fluffy little thing which looked like something out of space. This one we successfully reared. We hope we are going to be able to continue working with Tawny Frogmouths as there are presently quite a number of birds on the Continent. So if we work together we should be able to keep them going.

Finally, I would like to mention a few breedings that were not first breedings, but I think, in their way, were more successful. From four Chilean Tinamous received at Chester Zoo in 1980, a total of 172 bred were sent to other collections. Some of these still remain, for example at Child-Beale.

Four pairs of Mexican House Finches were donated by Customs and Excise in 1983. Since then we have bred 75, which all went on to different collections. Not an endangered species, nor a managed species, but more of a success I feel than were some of our first breedings. With Humboldt's Penguins, Chester Zoo had some success between 1986-89. In those four years we bred over 40 and sent them to other collections including Newquay, Whipsnade, Harewood, Merley and Copenhagen. We thought we were doing really well but then over the last few years we have had difficulties. Thank goodness that the birds that were sent elsewhere are now breeding. Penguins bred at Chester are now breeding at Antwerp, Copenhagen and in various other collections. Overall the population has gradually increased and the Humboldt's Penguin population is now being managed at a European level.

If we take part in these sorts of breeding programmes, even if we appear for a time to be losing birds in our own collection, it should balance overall. I think we all have to accept that with some species, at some times, we are going to have problems. However, by working within a broader programme we have the advantage that deficits at one collection can be balanced by gains at another so enabling the whole population to move forwards.

A similar story can be told for Waldrapp Ibis. This is another programme that now is managed in European Zoos. A total of 38 Waldrapp Ibis have been reared at Chester since 1990. In fact the programme is now so successful that we may need to find ways to stop breeding them. Already zoos on the Continent are talking about the need to reduce the number of breedings because of difficulties of finding enough good homes for the youngsters.

Flamingos do need better management. We are rearing perhaps three to six Caribbean's and a similar number of Chilean's annually at Chester. This

is only just above the death rate. Although we are increasing these stocks slowly, with the demand for the birds we produce we could increase it a lot more before having problems in finding collections to take any surplus.

Debbie Bourne talked to us at this symposium about cranes. It is really important that we have good managed programmes for cranes. We have now produced six youngsters from one pair of Red-crowned Cranes, the last two chicks this year where both reared by the parents. Initially we were using bantams. Debbie didn't mention that bantams are a very useful way of rearing cranes as an alternative to them being hand reared.

Ten Andean Condors have been reared at Chester but because of the unpredictable behaviour of their parents all have been hand reared; the last ones with the use of condor "puppets". We are already now at a stage where breeding must be slowed down or every Andean Condor in the country could be related to ours.

Spectacled Owls are difficult to breed. Over the period 1984 to 1991 we reared only five chicks. It should have been a lot more than that. We now have a "Joint Management of Species Programme" in the UK for Spectacled Owls. The population has increased very slowly with only a couple more birds now than we had five or six years ago. It is going to be very important, if we are going to contain these beautiful Owls in our collections, to continue to work very closely with each other.

Alan Griffiths was the first person to breed Blue-eyed Cockatoos in 1964. Chester came onto the scene a couple of years later when five birds were purchased from Mr Best in 1966. We first reared a chick in 1973 and since then have reared 23. We have now birds out on loan to Rotterdam, Paignton and Paradise Park and another two collections are shortly to receive them. Our difficulty is that most of the offspring are from one pair so we need to look, perhaps, to the United States for some fresh blood.

Finally, and perhaps the most important bird of all is the symbol of the *Avicultural Society*, the Rothschild's Mynah. This is one case where, perhaps, aviculture can claim to have been successful with a species now critically endangered in the wild. If aviculture was in the first place the reason for birds being removed from the wild then it can now make amends by helping them to go back. Probably less than forty birds now are left now in the wild. There are very intensive management programmes in zoos in the UK, Europe and the United State. Perhaps this is something that private aviculturists should also think about, for which the *Avicultural Society* could take a leading role.

G.E.S. Robbins**Quail & Partridges in Captivity at Present**

As some of you may know my particular love initially when I entered aviculture was in fact Quail. I am now going to give you an illustrated slide show on the Quail and Partridges available in aviculture today, not all of these are however available in this country. I am fortunate to being able to travel around the World and see these birds in their native environments as well as in captivity. I would agree with Roger Wilkinson's comments that if we are to see these birds in captivity in the future, steps will have to be taken to ensure adequate breeding programmes are undertaken. In the case of Quail in quite recent times you could buy them in pet shops. This no longer applies. A very good example of this is the Rain Quail which comes from India. During the 1950's/60's large numbers were imported and aviculturists would have them in their aviaries. Little interest was taken in breeding this bird.

In 1980 the Quail Group of the World Pheasant Association was formed, with a view to bring together some of these species, which had all but died out. The reason for this was the birds had at one time been very cheap, not that easy to breed, easily replaceable, and the incentive had not been there. Regrettably this incentive is usually financial, as has already been mentioned earlier today.

Regarding the Rain Quail in 1980, we were able to trace a single male in Shoeburyness, Essex, and this bird was at least fifteen years old. It wasn't until last year that an aviculturist was able to bring in some Rain Quail from the continent, where a small number had been located. One of the problems today is still that Quail are relatively inexpensive, but the cost of transporting the birds from their country or origin to this country far exceeds the value of the birds. Another factor is that in their native countries there is often legislation which prohibits the trapping and capture of Quail. The trappers are encouraged to trap higher value birds. So we have a situation where these highly desirable birds which live on our aviary floors are literally dying out in aviculture. Unless we have specific breeding schemes, these birds will go out of aviculture.

The Harlequin Quail comes from Africa. One of the contributions I believe that aviculture can offer to ornithology is the observations made in our aviaries. It has been suggested by Professor Tim Crow in South Africa that the Asian Rain Quail and Harlequin Quail are taxonomically related. Certainly, if this is proved to be correct, there will be a few eminent people who have written extensively on the subject and they will be most put out. The similarities are, size, coloration, display, size of egg, colour of egg, type of nesting terrain etc. The scientists will take note and in fact do DNA comparisons. At present Professor Tim Crow is undertaking this research.

The Stubble Quail is very similar to the Japanese Quail from Asia. It is possible that there could be similarities between these two Quails. It is possible that this came about when the continents broke up so perhaps the Stubble Quail is a sub-species of the Japanese Quail, that you see in a lot of aviaries today.

Regarding the North American Quail, these are bred in large quantities in the United States and have been for a number of years. Again we have to import these into this country, and this costs a lot of money. We have been keeping these going now for several years, but even these are now beginning to decline in numbers, therefore we have to import to maintain numbers.

The Scaled Quail was brought from the United States in 1983 where it is endemic in the Southern States and Mexico. The birds brought into this Country were in fact the Chestnut-bellied sub-species, and very few of the Blue-scaled Quails actually came into this country. Regrettably the birds have become mixed-up, as it is very difficult to distinguish the females of the two sub-species.

In recent years the Mountain Quail has been imported, and I am delighted to report that we are having success, although they are difficult birds to keep. They are very susceptible to worms. Therefore most of the stock falls foul to that contamination. They are best kept off the ground, in small aviaries with sandy floors. It is best to describe their accommodation as chicken hutches. They will reproduce, but with many of these birds they only breed for up to three years, after which their chances of reproduction are greatly reduced. Therefore, this greatly adds to the problem of reproduction. Whereas a Parrot may live 50 years and reproduce for 30 years, with the Quail three to four years is good. You are faced with a completely different approach to reproduction.

The Mearns Quail is regarded by myself as being one of the most difficult small Quail that is available to aviculture. We had them in this country, but we had a situation where they were reproducing only males. In the United States they were fetching high prices approx. \$400 per bird, and this for a bird no bigger than a Song Thrush. We have bred them in this country but it was only males. Most of the breeding is now done on the continent. I am confident that there are only a few males left in this country.

The Brown Quail comes from the Far East. I am confident that it has never been seen in this country. In size it is very close to the King Quail better known in this country as the Chinese Painted Quail. There might be some relationship there, but we are not certain.

We are sometimes asked what is the difference between, Partridge, Quail and Francolin, and I cannot say. It seems to be a matter of terminology, and even scientists cannot help us. The term, small game bird is probably a good description.

The common Grey Partridge is found in this country. The Russians are now starting to take these birds from the wild and are starting to breed them

as we breed our Grey Partridge. We have already seen some of these come into Europe and some have been bred in Europe.

The Snow Partridge, is one of the rarest, coming from China. The Chinese have just started to breed a few of these in captivity, but as far as we know, none have come out of China. They are part of a captive breeding programme that the Wild Life Department are undertaking. As with so many of these birds, the Wild Life Departments in all countries are begging people and governments to realise that they have got to do something about captive breeding. You can't just let all the terrain be lost to various distractions. They have got to really start thinking about a breeding programme albeit on a very limited scale.

The Chukar Partridge used to be released into this country for shooting but now it is restricted. They are beginning to die out as far as avicultural birds are concerned.

The standard Red-legged Partridge which we have, is quite common in the wild. They are being bred in large numbers as far as game birds are concerned.

We now come to something which is a bit different. This is the Arabian Chukar. I have just imported two pairs of these for San Diego Zoo, who in turn have started a programme with the Breeding National Centre for captive breeding in Tieve, Saudi Arabia, where they are trying to propagate these species as an ongoing game bird. It is going to be very interesting to see the sort of things we have to do with this one to get it going. It certainly is a lot more difficult to breed the standard Red-legged Partridge. This is quite an interesting bird in the aviary. It will run around and can become quite aggressive. It is very large, it stands about 38cm high. It is not like the normal Red-legged Partridge, but quite a character. The red bill stands out and he has got big face tucks. When they become very excited their brownish black crown comes up and they become quite aggressive. It is a bit like a Palm Cockatoo.

The Barbary Partridge which is also related and found in Morocco, is again a difficult species in this country although they breed. There are only a few left and they are very susceptible to worms. Most people regrettably have to keep them on wire.

The Philby's Rock Partridge has an overlapping range with the Arabian Chukar. This is an Arabian species which has a similar coloration. Most of these I am told are most difficult, as they require quite a dry environment when their eggs are being incubated.

The Sand Partridge, is again not much bigger than a Thrush in size. Not a lot of work has been done, but San Diego Zoo has been doing a lot of work with them. However, at present they have not had too much success. They then put them out to a private breeder, who has made quite an impression

on the stock. Hopefully we might see these in this country in larger numbers in the future.

What is the difference between Francolin and Partridge? Being a complete novice, I would say not a lot, because even the professionals can't agree what one is to the other. The Crested Francolin has interesting features. We had them in this country up and to about two or three years ago. Ivor Burgess in Sleaford bred these, for the first time and he found they had very interesting characteristics. Being a South African bird, the chicks did not pick the egg, they burst the egg open, a bit like an Ostrich. Another question that they pose is, "What are the relationships between terrain and climate?" They certainly need quite low humidity for incubation.

The Swamp Partridge sometimes called the Swamp Francolin, has recently become an endangered species as with so many of these tropical species. Really we do not know a lot about them. We certainly have not studied them in the wild, so there is a tremendous opportunity for individuals who have these birds to study them in captivity. You will learn a lot from them. They are great characters. There is a group of these being put together in India at the present. They are found in elephant grass type terrain, so they are not easy to see, but you can hear them pretty well. They have got a good call voice. The locals will not go into the elephant grass because they fear Tigers and other predatory animals. There is therefore a certain amount of protection in their habitat from humans.

The Common-hill Partridge, is another one we brought in from Nepal. We have been quite successful establishing them in this country, and in fact (mentioning Dave Coles again) he has been breeding them on a regular basis. They are parent reared in his Thrush aviaries at Childe Beale.

The Annamese Hill Partridge is a difficult species, I have found. I have only ever bred them once, although Cliff Poney seems to breed them like chickens. They are a very colourful species, but a tropical Partridge in that sense. We have found that they will only really breed if they are in a fairly warm high, humid atmosphere.

The Hainan Hill Partridge is one of a group of something like twelve Hill Partridge of which quite a few are represented in captivity, but not in any great extent. You have individual collections and Zoos concentrating on them, but not really expanding the whole population.

The Sumatran Hill Partridge is an interesting story for me to tell you. We brought these from the Continent as Sumatran Hill Partridge, and looked through the various books and we didn't find a lot of information until somebody came up with a theory, perhaps these Sumatran Hill Partridge, were hybrids. As it happens I was able to talk to Ray Decker in Holland who has quite a good collection of skins, and he said to go and look at the Raffles collection in Singapore. We went to Singapore on holiday and sure

enough this in fact is the Sumatran Hill Partridge. It is pure and not a hybrid. They have drawer after drawer of this particular species in their collection. There is a sub-species which is found on the mainland of Malaysia and in certain parts of Borneo. It is interesting how these birds have evolved. I bred them first in 1990.

The Brown-breasted Hill Partridge really get us wound up over tropical Partridges. It is found in various parts of South East Asia. We could not hatch the eggs when they were laid in this country. Work was done at Birdworld where we found that these eggs from this particular species need a much more higher humidity in incubation than the Sumatran and the Annamese. In fact the Sumatran need 55% the Annamese 50% and the Brown-breasted Hill Partridge something like nearly 60%. When you look at the distribution of this particular species, they are all intertwined. The question is why in captivity, do these birds need different humidity for their incubation?

The Red-billed Hill Partridge comes from Sumatra. It is at a breeding station in Malaysia. These have been brought over from Sarba where they are found. They hope to start a breeding programme as quite a lot of the Wild Life People and the Malaysian people are beginning to realise what is expected of them. I find it a most colourful bird. As far as I know it has never been photographed in the wild. The few that have were all in captivity.

My interest in the Roulroul has extended over many years. It was probably in the mid 1980's that I had my first pair. I couldn't get them to breed. So I sought some advice from John Mallet at Jersey Zoo who seemed to be breeding them quite well. He said to increase the temperature to 70°F and see that they are sprayed regularly. I put a mist spray over the top of them, and increased the humidity in a special aviary enclosed in order to get the temperature up. In two weeks I had a nest. The female goes into her nest and literally pulls all the debris around her and whilst she is in there sitting, you cannot actually see her. Contrary to all this I have seen hens in an open nest. Any theory about building dome nests doesn't appear to be correct. For those who want to breed Roulroul I would certainly say you must increase the temperature and humidity and they will go down to nest very quickly.

The Black Wood Partridge is in captivity in a number of collections in South East Asia I don't think they have actually been bred in this country. Certainly I had them for about 5 years. We had eggs and that is as far as it ever went. They are very hard to keep from the point of view of settling down, as they are very flighty.

The Long-billed Wood Partridge is probably one of the brightness birds which I was able to film in Jurong Bird Park. Suddenly the bird appeared from the undergrowth, and I shot it! There is also the Ferruginous Wood Partridge which we have had them in this country. Winged World at Heysham had them nest but were not successful.

The Crimson-headed Partridge, is a quite spectacular bird. It is bigger than a Roulroul, and they overlap in South East Asia. They are in fact breeding it in some of the Wild Life Parks. A number have been shipped to the United States, in particular the Bronx Zoo. They held back 12 pairs in Bronx Zoo trying to get them to breed. It is an interesting bird, very colourful, certainly colourful when the light catches that iridescent head.

The Spot-winged Wood Quail, come from South America. We don't know a lot about the South American Quail. Various skins have been brought and illustrations produced, but in reality we don't know much about them at all. Again is it a Quail or a Partridge? It is a Quail I believe and it is quite a large bird.

The Buffy-crowned Tree Partridge is now being bred successfully in Costa Rica. We are very hopeful that they are coming over here to us.

The Black Francolin is another bird in our aviaries as is the Madagascar Partridge. Work has been done by Tim Crow. We have samples of tissue, and there is a direct link between the Madagascar and the Black Francolin as a related species. So that is some success. Up to that time science had not indicated at all that they were connected. They have done DNA profiling. Roger Wilkinson knows more about this than I do. He has met C.J. Sibley who is said to be the man of the subject.

Dennis Avon M.I.O.P., A.R.P.S.

Photographing Birds

It was in April that Ken Lawrence asked if I would give a talk about my experiences in photographing birds. I was quick to explain that I am not an expert on birds, I am only a photographer.

I decided to use the Kingfisher as my logo symbol, after one had taken the goldfish from my pond. Why do we need good pictures of birds? We need them for books, brochures, posters and for slide shows such as this. Many private bird owners require good pictures of their birds for sentimental reasons. Birds can be photographed in aviaries, against the wire or in front of a nesting box. These pictures of the birds can be excellent. But a much better result is achieved if it is taken in my box.

Some 23 years ago, I started experimenting with the idea of making up a special photographic box. In order to make it work, I would need to make fairly large colour prints of suitable backgrounds. These backgrounds would need to be evenly lit from each corner, hence 4 flash guns to start with. The flash on the birds would need to be soft, positioned in front and above.

The plumage of the birds must be good because a Nikon 105mm macro lens will resolve the finest detail, on a fairly slow colour transparency film. Some birds look good on their branches, surrounded with contrasting autumnal leaves. I think a simple sky background looks good for some birds.

The backgrounds I make myself. The large prints are made from a 6 x 9 cm colour negative. To enlarge and process one of these, a colour lab would charge about £40, and that does not include the actual going out into the countryside to find the right kind of backgrounds and taking the picture. So you see, they are not cheap. When I have used the backgrounds a few times, I make new ones.

I must admit Tanagers are one of my favourite species. At present, I have taken about 40 varieties. Some birds such as Sunbirds, are naturally dark in colour. In order to show the beautiful metallic sheen, I increase the power of my front flash. If I do not increase the flash, a Copper Sunbird would photograph almost black.

As you can imagine, it is not easy to take good groups of birds. When Mike Fidler wanted a cover picture of Gouldian Finches for his and Stewart Evan's book, I knew we had a problem. He wanted an upright format with the birds nicely spaced and all looking to the front. We decided to use a branch at about 45 degrees and space had to be left for the title of the book. In the end Mike had to hold a branch and with lots of luck we got 4 shots.

Many photographs have to be planned well in advance and may call for a special background. A cock Bearded Reedling would look nice against a water background (as seen on the Norfolk Boards). You would use foliage on which these birds would naturally feed. You may say that this is cheating, maybe it is, but I never claim that all my pictures are taken outside. I am out to produce a good representation of a bird in a natural-looking environment. Plus the fact that it is often raining outside. Woodpeckers require a suitable tree trunk. I searched and found one at a timber yard. My workshop is full of similar pieces of timber and branches. A Wheatear would look good against a loose boulder background. There is no limit to what can be done under controlled conditions, given the time. Many parts of TV wildlife programmes are made this way. A beautiful mossy log just screams for a little Woodmouse, all carefully planned beforehand. All the very small mammals photographed in my box have been returned to the very place they were caught. Pale birds require less exposure in order to hold highlight detail.

For many educational and scientific purposes, we need good sharp slides to show comparisons. At times I have to change my photographic technique. I have a "canary/budgie" box. It is smaller and was designed to allow the normal wire cage front to be dropped down. The use of a blue background gives the ideal contrast.

Type canaries are very difficult to photograph. One has to get the bird at its correct stance. When the wire front is lowered, the bird gets confused, but Editors like pictures without wires.

When photographing winning birds at exhibitions, no bird must be handled. Therefore, I designed a system which allows the birds to hop into

my photographic box and after the pictures have been taken, the bird happily hops back into its own showcase. Recently, when working in Germany and photographing delicate Frill Canaries, as the birds were returned to their showcages, there was a murmuring from the owner of "Ach Wunderbar das ist schoen!"

I would like to deviate for a moment and discuss title slides such as one might require for a talk such as this. If normal typewriter text is photographed, it may be too fine and illegible to be visible at the back of a large hall. Also, it will show any dust and dirt. Use a bold typeface. This can be typed on a modern word processor. The text can be photographed with a 35mm camera with a 105mm macro lens using a special Lith type film. The resulting high contrast negative can be used. But you may wish to have a blue diazo contact slide made from the Lith negative. Bear in mind a 35mm camera has a 2 x 3 proportion format so have your bold type set to fill that area, either landscape or upright format.

Maps may help to make a talk more interesting. You can use a political map (if country names are up-to-date) or a physical map. Finally you may wish to go in close and give detail of the actual area where the birds are found. I must warn you of a copyright on maps etc. If in doubt, approach the publisher and explain why you wish to use a certain map. Generally, it is only to show an audience, there may be no problem. Many people copy maps - even I do and I do not ask permission. But your have been warned!

The owner of a bird telephoned to say that she had an unusual bird. She wanted photographs and could I help. Naturally, I said yes - but the owner did not want any publicity. The photos turned out okay and the lady was given free slides. The results laid in my library for well over a year, then a telephone call told me that the bird had died and that I could now use the slides for publication. This kind of thing happens often, where the owners have trusted me to keep their secret quiet. **Slides are never used without owner's permission.**

We hear so much of bird thefts. Have you ever thought of using detailed pictures of your valuable birds as means of picking out a stolen bird? Take for instance a Toucanet. Unusual marks on its beak could identify a stolen bird. A bird who has lost some toes and/or has a crossed beak. These features could easily identify a stolen bird.

Hummingbirds in flight call for a special technique. In order to freeze the fast moving wings, the speed of the flash must be in the duration of a 1/6000th of a second (or shorter). But there is a snag. When you reduce the duration of your flash, you also, lose power and may have to use a much faster film, together with the problem of grain, or use of large lens aperture and lose depth of field. Even when some pictures have been taken, you will not know if the wings of the bird have covered the beak and face of the bird until the film is processed.

As with all birds photographed under controlled conditions, very great care must be taken to avoid stress because of the often great value of each bird. With Hummingbirds, they have to be allowed to feed, or they become torpid.

There are some cases where I do not wish to handle birds. Perhaps I'd better explain how I work. As I do not use glass in the aperture through which I point my camera (for fear of injury to the birds) I always like to work in a darkened room.

Once a lady left me to photograph her pair of Green-naped Lorikeets and said, "When you have finished, grab them from the back". After taking some good pictures, I did just this. In the very dim light, the first bird got his beak into a fleshy part of my hand. Amid screams from me, I could feel the blood trickling down my elbow. Please do not laugh, I didn't. On the way home with my hand bandaged, I swore this would not happen again.

So, back to the design and now I have a special catching box which fits onto my photographic box, and, by a simple method of turning certain lights out and certain lights on, there is no chance of getting bitten but, what is more important, the birds are not put under any stress.

For a recent book that I helped on, many maps had to be drawn. This I enjoyed doing as, during the last war, I had spent five years in the Middle East with a R.E. Survey unit drawing maps for RAF bombing raids. Then there was the question of showing the underwing colours of 12 different Rainbow Lorikeets. Some of the birds were not in this country, so reference had to be obtained from skins etc. Probably because I had not used my designer skills for a long time, this particular drawing took at least 100 hours to complete, and will be one page of a book. The majority of the pictures will be from colour slides.

Finally having taken our colour slides, do we know how long they will retain these saturated colours ? Kodachrome is about 25 years. All E-6 processed films such as most of the ones that I have been showing today, would be less. Normal colour prints (made from colour negatives) will fade in strong sunlight in a matter of weeks. If you have a good colour transparency, I suggest you have a Cibachrome Print made from it. (They are not supposed to fade, the dyes being Diazos).

This was the most difficult talk to reproduce as Dennis showed 77 slides to illustrate the points he was talking about.

R.C.J. Sawyer**Aviary Constructions and Birds at Cobham**

This talk is about some of the ideas that have been used in the construction and planting of the aviaries at Cobham. I will be making references to a few of the birds kept and bred in them over the last 20 years. For those of you who don't know the construction at Cobham has taken many years. Those of you who came in 1976 when we held the first garden party for the Society and have regularly attended since will be aware of the gradual increase in the numbers and varieties of aviaries.

Whenever possible we try to make aviary frames "light" by using gas tubing. The gas tubing is cemented into the ground. We use ordinary galvanised netting most of the time and this is painted black using Finnigans Hammerite paint. It is applied straight on with a brush. It appears to have no ill effects to the birds. I strongly believe that all aviary wire ought to be black. When I first started working for the London Parks their aviaries were silver and it is awful to view the birds this way.

In all of our larger aviaries we try to incorporate a garden in the front so that it blends in and you lose the wire netting. The netting varies in size, but it is usually 12mm or 19mm but it is not welded mesh. On some flights we have used nylon netting which can be purchased pre-cut to your particular requirements, but this is only for the roof. The sides are in ordinary wire netting. One of the aviaries has had it for 18 years and it has been successful. It also helps when there is snow. We use angular sections of gas tubing to provide extra support to the roof. Key clamps are very easy. The nylon netting is 12mm and is black. There are two drawbacks that may occur and we have had neither. If you have rats or squirrels, both could eat through the nylon netting. Despite being in the country we don't have squirrels and we are always on the lookout for rats, mice etc., and take precautions. You must never let your guard down.

By landscaping your aviary you gently enhance its appeal. Hopefully the birds will like it. With lawns we cut them and this greatly surprises people. They are cut with a mower and the birds will just sit there. If we take our main breeding pair of Black-winged Stilts they rear 4 young each year. You can go by them with your mower and they just sit there on their eggs. Not all our Waders are so good so you have to be careful. When nesting the Black-winged Stilts can have no other Waders in their aviary. They become very aggressive and when we had our old Scarlet Cock of the Rock they would fly up and attack him as he was on his perch.

Coming on to ponds, we always have the water just running because if you don't you are likely to get feather problems. This has certainly been the case with lots of other people. What happens is that in still water an oily film builds up and when you have birds, in particular Waders, this is transferred onto their feathers, and then you get feather problems. You only

need to keep the water moving slowly and you will be spared of these problems. At Cobham we therefore have no still water ponds. We use shingle or silver sand for the bases of our streams were appropriate.

If you can put in a waterfall the birds will love it. When we turn the pumps on in the morning, the birds are immediately down to it whether to drink of to bath and it is only the same recycled water. This applies to all birds from Pheasants to Hummingbirds. Our White-capped Redstarts love it. There are a series of pumps at Cobham either for the waterfalls of just recycling the pond waters.

Waders will insist on taking their food into the water and washing it. As those of you who have visited Cobham know in one of the ponds we keep Koi Carp with no problems at all. Most of the ponds are about 30cms deep with gentle sloping slides. You must never build a pond against the side of your aviary because if there is a night fright the birds may get disturbed and fly against the wires and perhaps drown in the pond. If you have a plate glass window like one of our famous Bird Gardens of the past, the birds stand no chance at all and would crash into the glass and fall into the pond.

Water lilies look very attractive on a pond and are particularly appreciated by our pair of South American Jacana. I am delighted to tell you that we have bred 4 this year. It may perhaps be a world first breeding, certainly for this country. The cock does all of the work. He builds the nest, does all the incubation, feeds the chicks and rears them. The hen only lays the eggs! When they hatch, they are like bumble bees, very small indeed. The cock would carry them about tucked into his feathers. We are very worried that there might be thunderstorms during this period but there were none.

Having a waterfall means large rocks and this again helps to breakdown the background. Rocks should be the first thing that you put in for obvious reasons. You would put a waterfall towards the back of your aviary with the water running into your pond in the centre. Every so often cleaning of the ponds may be required. Generally the water will not freeze in winter as most Waders will stand in at night. Water does attract insects in summer and these are eagerly consumed by our birds.

For those who can remember our original aviaries looked very spacious with their plants, but 20 years on things have changed. It is a continual battle trying to keep the vegetation in check. As an example dwarf conifers have had to be removed when they grew up 4m high. Of the original five aviary units the back two resemble a forest. The birds may like it but there are several problems. It is not pleasant on your eye when viewing. It is very difficult to check that all the birds are fit and healthy. Should there be one that need medical attention it is very difficult to catch as is any bird that is being constantly harassed. I would, like to point out that several deaths are due to aggression between various birds, even pairs. This can lead to death by fighting or just stress.

Now for a few tips on plants that my help you. *Pyracantha* is a good plant for aviaries. We have tried Maples but they are impossible in an aviary with finches etc., as the birds will go for the buds. Conifers on the whole are good, but you need to keep some of them under control. It is amazing how some plants grow much better than others. *Cotoneaster* is much appreciated as the birds will take the berries when ready. Russian Vine is a steady grower and will attract live food. Balls Golden Sage and Variegated Grass are used a lot. Our Yews have grown very well. In one aviary, they are spoiling the rock landscape. Heathers have been found to be very good. Palms can be successful but care must be taken. An expert on Palms told me that they would be all right, but some "melted" in the first cold winter we had after having them.

The *Phormiums* are excellent growers but you may have a problem with a bird getting caught in them. The Monkey Puzzle Tree is eye-catching, but needs attention every year to keep it under control. Fig trees have proved ideal and highly recommend them. Red Hot Pokers look lovely and are much appreciated and used by nectar feeders like Sunbirds.

Obviously in a planted landscaped aviary your birds have a great variety of perching to choose from. Some birds like a firm perch others a springy perch. Some like small and other like large perches. For roosting, a bush is often appreciated.

Some perching birds nest naturally in a bush or on a ledge whereas other require an artificial nesting site. In a large aviary you need to have plenty of potential nesting sites for the various types of birds that you have in it. If there are not adequate sites competition may occur which may lead to even death. Emerald Starlings were one of the numerous first breedings and they use a nest box. They are one of my favourite birds, and on a sunny day there are few birds to match their beauty. Incidentally, they do not make good show birds, as they have a tendency to stay on the floor of their cage and generally they are nervous in a confined space.

White-breasted Crake are a particularly vicious bird. Although spending a lot of time on the floor in company with Waders they love climbing in trees and bushes. They roost at night sometimes as high as they can. They are very difficult to sex and don't take kindly to surgical sexing. They nest high up sometimes in an open fronted Finch type nest box. We had an unfortunate experience when we introduced some new ones into our flock. Six of the new ones were killed by one of the residents in a single night.

Jungle Fowl and a planted aviary are not a good combination as they destroy the plants. This can apply to several species of Pheasants and Tragopans as their larger feet can turn the grass to mud at times. Satyr Tragopans breed in one of our paddock aviaries where the Cedar Tree has grown out of control through the roof. This greatly distracts the pleasant view that there ought to be. These paddock aviaries have wooden backs and

have open fronted shelters. They are ideal for Choughs, Azure-winged Magpies, Pheasants etc. They are constructed of 50mm square timber with artificial perching. There is trellis work at the rear. The aviaries face north so they don't get much sun. At one time Cranes were kept in this paddock but when it was windy they took off and could get over the 2m high fence. We therefore put up some netting and planted some trees which now are reaching maturity.

There is a particular Yew Tree in the grounds and we have put a Macaw aviary around it. We have put weld mesh around this Yew Tree and the Macaws keep it beautifully trimmed. The Yew has given us no problems but many books advise against this as the Yew is poisonous.

Keas have bred for us numerous times over the years. My friend, the late Sidney Porter, achieved the first breeding in 1946 when he lived at Derby. He had a big garden but had houses quite near so his neighbours kept complaining regarding their extraordinary noise. We have two young this year but ours are not as noisy as Sidney's were. Another unusual breeding this year was the Masked Lapwing, which bred with snow on the ground. The hen just sat there. Luckily the snow melted quickly. We were the first people to breed this bird in this country.

There are a range of six small flights for tropical species that need heat. We used polycarbonate triple thickness for the roof which helps keep the heat in, allows light in and you don't need wire with it. It also doesn't get dirty. It keeps very clean and doesn't shatter. There is a corridor with doors at either end which are open all day in summer to aid ventilation. It does tend to get rather hot at times in the summer. Our cactus house has a similar roof with a glass fronted sliding aluminium door. Talking of the cactus house reminds me of our Crocodile Birds. It is said that you need 120 ° F in the sand for the eggs to hatch. Perhaps heat panels could be tried providing you could induce the birds to lay.

Another couple of aviaries have been built using 75mm square timber. The timber is not cemented into the ground, unlike the gas tubing. The aviary's roof is square pipe, welded with a rise so that if we get any heavy snow it will spring and not give. So far we have been lucky. There is nylon netting on top which means that it doesn't look too "heavy".

One particular bird that we have had for years is a male Purple-throated Fruitcrow. We had two but never obtained a female. I remember John Yealland paying £7 for one when I paid £7 for a Hummingbird.

Several of our shelters at Cobham are block built but there are wooden ones as well. Most of them are heated so that the birds can go in at night. But they do like sleeping outside and in a large flight it is unwise to try to put them in. Hummingbirds roosting outside get nectar first thing even in freezing conditions which we don't get very often in Surrey.

One tragedy this year was over our hen White-breasted Kingfisher that came out of her nesting burrow at night, when egg bound, and fell into the pond in her aviary.

Finally mention must be made of the Rothschild's Grackle which we have bred in the past at Cobham. I remember them attacking our Temminck's Stilts and killing one of them. They seemed to take it out on our Waders but not on other birds.

* * *

Referring back to Raymond's earlier talk, the Chairman asked him to say a few things on John Yealland, who was one time our Editor and curator of birds at London Zoo.

"John Yealland was a great friend of mine who started off as a young man with the Marquess of Tavistock. John's father was already working there but he died soon after and John took over even though he was perhaps still a teenager. He was very efficient. He then went abroad to the continent where he was responsible for some very big collections. He worked for Derscheids who were famous aviculturists in Belgium until the war when he had to escape quickly or be captured. As you all know poor Jean Derscheid was tortured through the war and he was shot for helping British troops to escape out of Belgium. When John came back here to England, before I joined the Society, he went with Gerald Durrell to West Africa to collect birds. John then went to Slimbridge. I remember Jean Delacour telling me that he went to Slimbridge with Peter Scott and Dr Hindle to look at what they thought of it as a site for the Wildfowl Trust and John Yealland was made curator. He was really responsible for starting the Ne-ne Geese. He went to Hawaii and brought back the eggs and reared the ducks. He was a very quiet person but he was brilliant really. He then left Slimbridge and came to London Zoo, in the early 1950's as curator of birds where he stayed until he retired".

The Chairman then stated that whereas there is a wealth of information on Jean Delacour, there is nothing on John Yealland in the magazine. Roger Wilkinson agreed with this and said that there were other as well who deserve recognition. The Chairman also mentioned David Attenborough and Sir Peter Scott who Raymond knew in those early years. The Chairman said that as a young man he had met Wilfred Frost at London Zoo where he had Wilson's Birds of Paradise for sale at £75 each, a large sum in those days. Raymond added that the Greater Bird of Paradise was £125.00.

The Chairman concluded by thanking all the speakers. He said that it is important that those famous aviculturists from the past are remembered in the *Avicultural Magazine* as well as present members. He pointed out that Bristol Zoo had at one time a large collection of Cranes. The talk on Chester Zoo brought back memories to him as he had worked there for a time as a young man. He agreed with Roger Wilkinson that breeding programmes are essential as first breedings are a great thrill, but sustained reproduction



Photo © D. Avon

President of the Avicultural Society, Miss Ruth Ezra receiving an engraved bowl presented by the Avicultural Society from Vice-President K.W. Dolton

must be the aim of us all. Perhaps fewer species will be kept in the future. The talk on Quail was most interesting, as it is a group that is taken for granted unlike Parrots which receive a great deal of attention. If we cannot keep birds, then we can all appreciate good photography. And finally giving attention to detail in housing and accommodation can result in excellent breeding results as has been achieved at Cobham.

With a final round of applause for Andrew Richards, who had worked the projector for the slides, the day's session was concluded.

Saturday evening, members and guests reassembled at Bristol Zoo for a sherry reception in the restaurant. Some members and their guests attended the Centenary celebrations for the first time having had to work during the day, or had travelled a long distance to attend. The *Avicultural Society* was honoured that the Lord Mayor of Bristol was able to attend. Those present numbering about 90 then moved up the stairs into the Clifton Suite of the Pavilion for the Centenary Celebrations Dinner. There was a delicious 3 course dinner including a carved buffet. There followed the usual toasts and speeches. Messages received from the other societies were also read out.

During these a presentation was made to our Society's President Miss Ruth Ezra by one of our vice-presidents Ken Dolton. It was a glass bowl engraved with a Galah, Scarlet Cock of the Rock, Egret, Diamond Sparrow, Rothschild's Grackle, 2 Hummingbirds and a Greater Bird of Paradise. It was a token of appreciation by the members of the *Avicultural Society* for all the help, encouragement and kindness given by Miss Ezra, over a great many years. Incidentally she is the only our ninth President in 100 years and as you all know her father, Alfred Ezra, O.B.E., was our President at the time of the Diamond Jubilee in 1954.

After the dinner members and their guests were able to enjoy each other's company in a most delightful and relaxed setting.

Sunday morning saw members re-assembling at the Zoo for a conducted tour. Bristol Zoo is set in a beautiful twelve acre garden in the heart of Clifton. West Country people are proud of 'their' Zoo. Sunday was a warm autumn day and amongst the birds we were able to view Nicobar Pigeons, Luzon Bleeding Heart Doves, Keas, Royal and Grosbeak Starlings, Rothschild's Mynah, Toco Toucan, Yellow-throated Laughing Thrushes to name but a few. The Gardens, as always were a joy to view.

Around lunchtime it was off to the Tropical Bird Gardens, at Rode where we were greeted by Betty Risdon, Mike and Norma Curzon and their keepers. Here we learnt that a single Red-tailed Amazon Parrot had been reared by its parents. This appears to be a UK first breeding. (See page 49 of this year's 2nd issue for a detailed report).

All too soon it was time to say our farewells and the highly successful Centenary Celebrations were over.

OBSERVATIONS OF PARENT-REARING BEHAVIOUR IN THE LESSER BIRD OF PARADISE.

by Patti Cooper, Senior Keeper Department of Ornithology
Wildlife Conservation Society
Bronx Zoo/Wildlife Conservation Park

Introduction

In 1988, a hand rearing protocol for the Red Bird Of Paradise *Paradisaea rubra* was established at the Bronx Zoo/Wildlife Conservation Park (BZ/WCP (Worth et al 1991). Since then, we have successfully hand reared 26 Red and 12 Lesser Birds of Paradise. Periodic attempts at allowing for a parent reared bird had however, resulted in chick abuse or infanticide subsequent to the moment of hatch. In 1995 we had our first successfully parent reared Lesser Birds of Paradise in the propagation facility.

Propagation Facility

An off-site facility, Prop 1 has been modified through the years to accommodate the breeding requirements of Birds of Paradise. The classic lek mating system involves males gathering to perform elaborate courtship displays in communal arenas, with females visiting to select a mate (Emlen and Oring 1977). Our artificial lek comprises individual males in adjacent cages and individual females who are introduced into those cages with male access to female nest cages restricted. Detailed management techniques are outlined in the AAZPA Annual Proceedings (Hundgen et al 1990).

Paradisaea minor

Native to the lowland forest of north-western New Guinea (Gilliard 1969, Cooper and Forshaw 1977), the Lesser Bird of Paradise is a polygamous species that exhibits extreme sexual dimorphism (LeCroy 1981). Choosing a site away from the lek, the cryptically coloured females are solely responsible for nest building, incubation, and rearing of the young (Beehler 1986). Their nest is a flimsy cup-shaped structure of twigs, covered externally with dead leaves, placed 6m or more above the ground in a slender tree (Coates 1990). They lay one egg per clutch, cream coloured and streaked with longitudinal brown patches. In their native tropical zone, breeding follows the rainy season from June through to October. At our Zoo in the Northern hemisphere (with an adjusted photo period of 12 hours, at an average building temperature of 21 degrees C (70 degrees F), they breed from November through to April.

History of the Breeding Female at BZ/WCP

We acquired this wild caught bird, a presumed juvenile, in February 1989 and began introducing her to males that October. There are 2 fully plumed adult males to whom she has been alternately introduced, and showing no preference for one (which is often the case at a natural lek, Beehler 1983), has reliably bred with both. She laid her first egg in February 1991 and incubated for 14 days, after which we pulled the egg and hand reared the chick. By these means she produced eight more chicks in the following

three seasons. In March 1994, we let her hatch a chick, and it survived 12 days. The subsequent two eggs of that season were infertile (the males having gone into moult), and she did not lay again until October 1994.

Modification of Nest Cage

It was suspected the loss of the March 1994 chick was due to the disturbance of the female by the proximity of other Birds of Paradise. Observations of nest sites in the wild have indicated a lack of tolerance by female Birds of Paradise for conspecifics in the same area (Clifford Firth, pers comm.) With the intention of further isolating this female, the following season we removed the birds directly adjacent to her nesting cage, and partially blocked the view of another female two cages away. Two males were across the service alley (fig. 1.).

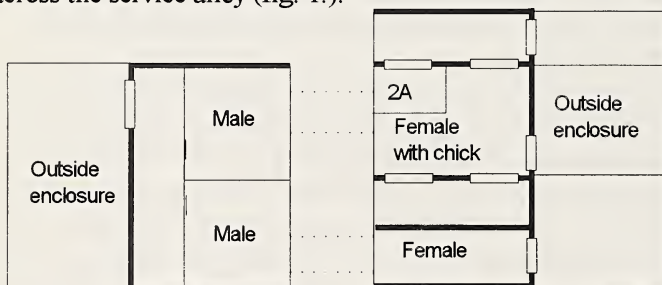


Figure 1. Enclosure design of female Lesser Bird of Paradise with chick (5metres x 4metres x 3metres)

Nest and Incubation

As in previous seasons, the female nested in a wood box (33x11x9cm with an 18cm opening) 2.7m off the ground (just below the ceiling). She constructed a cup nest of curtain vine and palm fibre that met the lip of the box, with 7.5cm of oak leaves and shredded cypress bark beneath it.

To ensure survival, the first two chicks of the season were pulled (laid 15 October and 3rd December 1994), and the chicks hand reared in the brooder room. (The nest was torn down by the female after each egg was pulled, and rebuilt in a similar fashion). On January 3rd, 1995, the female laid a third egg, and was given the opportunity to rear the chick.

We modified another management variable by minimising bird/keeper presence in the nest cage at the same time. During incubation the female was offered access to an adjoining outside yard, and quickly trained to shift outside while her cage was cleaned and the nest checked. (The mildness of the winter allowed this, and average time spent outside was 2 - 3 minutes).

Food

The basic diet of the adult Birds of Paradise consists of a low iron pellet (Zeigler Bird food), and mixed fruit salad. Mealworms (beetle larvae) or

crickets are offered as treats. The basic diet of hand reared chicks (fed approximately every two hours from 6am - 4pm) for the first 2 weeks, consist primarily of cut up pinky mice. On the 14th day of incubation, extra insects, waxworms and mealworms, and cut up pinky mice were added to the female's food pan.

The chick hatched on the 18th day (January 21st), the female depositing the shell in a back corner of the cage. Fresh pans were given at 6am, 8, 10, 12, 2, and 4pm.

Food items (in general order consumed by the female), included large mealworms, waxworms, mealworm pupae, small mealworms, whole grape, pinky pieces, crickets, cut grapes, blueberries, egg whites, apple, and Bird of Paradise pellets. Occasionally beetles and walking stick insects were offered.

It was unclear what the female fed the chick in the nest. After fledging, it was observed the fruit, waxworms and mealworms made up the bulk of the diet (fed by regurgitation), though a wild caught field mouse was also fed to the chick 21 days after hatch.

Behaviour of Female Towards Fledging

The chick fledged 18 days after hatching (8th February), and weighed 90 grams. One day prior, the female had become very active, showing specific agitation (by way of a distinct guttural growl) towards the female two cages away, and to the males when they would come in to view. Blinds were put up, and virtually all visual access to other birds was cut off.

The day after the chick fledged, the female threw the nest out of the box and attended the chick (who was not quite ready to fly), on the ground. Between feeding and preening the chick, she displayed the sporadic behaviour of gently pinching its head, and pulling at its legs and toes.

Though fully feathered and flying perch to perch by day 25, the chick did not go near the food pan, and at 40 days was still dependant on the female for food. She had begun to show interest in the males again (by attempts to see them, soft vocalisations, and consistent perching on, or near the introduction door). The toe tugging became increasingly aggressive over this time, and culminated in an apparent attack which resulted in the removal of the chick on 4th March (at 42 days).

Female Recycles

Introduction to one of the males began on 8th March, with the female immediately soliciting copulation. Three days later she had built a new nest. Copulation was observed on the 12th and 15th of March. The male began moulting on the 18th, the female would not shift for introduction on the 19th, and she laid an egg on the 20th.

As with the first chick, this chick was hatched 18 days later (7th April), and fledged 18 days after that. Its weight was 70 grams. Once again the female was observed tugging its leg, and the chick was moved to an adjacent cage on day 19 (marked 2A in Fig 1.).

Within a day the chick began accepting hand feeds from the keeper. It continued begging to the female however, who in turn tried feeding it through the screen of the cage. The test of letting female into chick's cage had interesting results.

While inside the chicks cage, the keeper opened a shift door. The female came into the cage and began feeding the chick. Within minutes (it seemed to correlate with being unable to evoke any further gape response), she began pinching the chicks' head and tugging at its leg.

Appearing not to be bothered by the proximity of the keeper (1m. away), the female allowed herself to be shifted out of the cage.

These "supervised visits", continued as the chick begged, or about every hour and a half. Because the female fed primarily fruit and worms to the chick, and its weight was lower than that of the first chick's, hand feeds of pink pieces were supplemented by the keeper.

"Co-rearing" by female parent and keeper continued for 10 more days until, with encouragement, this chick was eating on its own at 28 days.

Chick Weight and Gender: Hand Reared vs. Parent Reared

Figure 2 compares the average daily weight gain of 7 hand reared male Lesser Bird of Paradise chicks and 4 hand reared females (from hatch to day 50). The 3rd line represents the average daily weight gain of the parent reared chicks (from day 18 to day 50), and most closely corresponds to the weights of hand reared females. Eventual blood feather sexing determined both parent reared chicks to be female.

Additional Notes

Though still not eating on her own at 42 days, it took keepers just two days to encourage the first chick to eat independently. Comparatively, hand reared Lesser Birds of Paradise require more time and much more encouragement to eat independently (24 - 28 days) than hand reared Red Birds of Paradise (17 - 21 days), (Cooper P. pers. observ. and unpublished data BZ/WCP).

Discussion

Communication with field researchers provided ideas for modifying cage variables as well as trying to understand the needs and behaviour of a nesting female Bird of Paradise. Isolating our female may have been a key to this success. It should be considered too, that once fledged and in the confinement of a cage, the chick becomes a conspecific in the nesting area. If perceived as such by the female, this may account for the aggression towards it. Exploring this principle, the nesting cages of the other breeding females have been further spaced apart for next season, and visual access can be eliminated. An empty cage has been made available next to each nesting cage that will serve as neutral territory during introductions, and can provide sanctuary for a fledgling if need be.

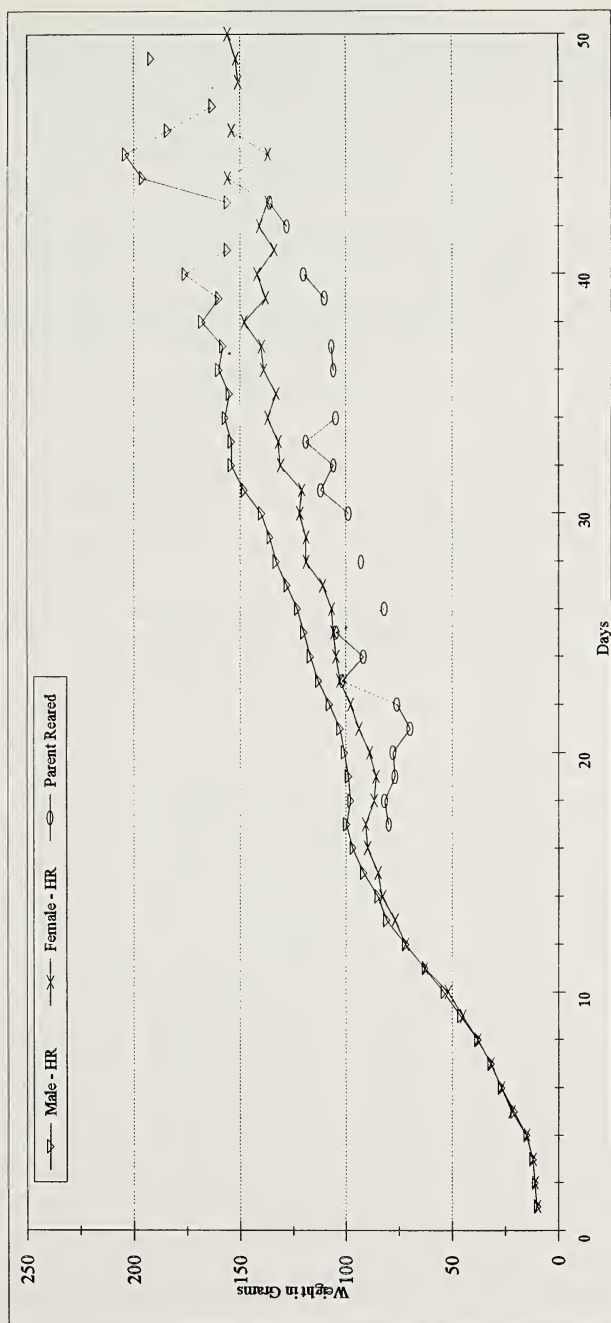


Figure 2. Growth Rates in Lesser Bird of Paradise Chicks. Blood feather sexing determined the parent-reared birds to be female.

ACKNOWLEDGEMENTS

This individual success raised hopes for expanding the Bird of Paradise breeding programme to include hand reared or parent reared chicks. Thanks go to Dr. Donald Bruning, Dr. Christine Sheppard, Mary LeCroy, Clifford Frith, and Dr. Bruce Beehler for their input and information towards this endeavour.

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THE REDSTART

By Rob Taylor

The keepers of British Softbills suffered more than any other aviculturists when the Wildlife and Countryside Act 1981 became law. Up until then many fanciers kept collections of Softbills and practised the difficult art to keeping them in excellent condition. Every top Softbill show team in the land contained a Redstart Cock; the supreme showman.

The uninitiated could be forgiven for thinking that a Redstart is a Foreign Softbill, so striking is its coloration. Its black throat and face contrasts with its white forehead. Its blue and grey upper parts are the perfect foil for its orange-red underparts. The orange-red tail vibrates constantly with an excited up-and-down movement further enhancing the showmanship.

After the 1981 Act, only seven Softbills remained on the list of those which can be exhibited and four of these are designated pest species. The seven are the Magpie, Jay, Jackdaw, Starling, Dunnock, Blackbird and Song Thrush. The Redstart was a great loss to the show bench. The British Bird Council's (B.B.C.) breeding programme is aimed at helping experienced fanciers to breed Redstarts, with the intention of increasing their numbers to such an extent that they will be permitted to be exhibited once more. Understandably, Redstart breeding slumped dramatically as an initial reaction to the Act, but it is pleasing to report that the number being bred in captivity has increased greatly since the programme was instituted.

No one would pretend that the Redstart is an easy subject to breed. The facts that the species is migratory and, under normal circumstances, produces only one round of eggs add to the difficulties. Providing sufficient livefood of the required type to support the chicks for the first few days is a constant problem. Special measures need to be taken if Redstarts are to be prevented from falling into a moult as soon as they are introduced into the breeding aviary. For this reason, winter management takes on increased importance.

In nature, Redstarts would spend their winter in Africa and enjoy longer day lengths than those available in the British Isles. This means that the use of artificial light is beneficial, but only enough - say 1½ hours a day - to increase the opportunities to feed. Lengthening the day to an apparent 14 hours would be counterproductive, in that it could very well bring on a moult. Just enough heating is supplied to prevent the drinking water from freezing. Draughtproof quarters are essential. Preparation needs to be made for the day, in early April, when the cock and hen will be introduced to each other. An unplanned introduction can result in one partner killing the other.

I have been taught the value of a gradual introduction - both of one bird to the other and of the birds into the outside aviary. My Redstarts spend the winter in inside flights or flight cages, with cocks separated from hens. From early March onwards, as long as the weather is dry and mild, they are put

individually into single breeder cages and placed in a sheltered part of the outside flight for two hours in the middle of the day. This task is undertaken by my wife. This gradual exposure to the elements hardens off the feathering and goes a long way to preventing a moult which would upset the pattern of breeding. The cages are located so that cocks and hens can see each other; a preparation that reduces the risk of fighting. Once paired the sexes will live peacefully together until September, when they need to be separated once more.

The bigger the flight, the easier it is to breed Redstarts. This is not just because Softbills are very active and more space gives the opportunity for one bird to hide from another, but also because more livefood is attracted to the greater number of plants that a large flight can contain. In my establishment, a fully planted 12.2m x 3.6m aviary houses one breeding pair of Redstarts, plus two pairs of other British Birds. I have found that the livefood offered by the breeder plays little or no part in the initial feeding of the chicks. During the first few days the parents cannot collect enough of the tiny winged insects, minute caterpillars and even crustaceans that are almost invisible to the naked eye.

My aviaries contain a very wide selection of plants or shrubs. Four Honeysuckles attract masses of valuable aphids, though they also attract blackfly, which my Redstarts seem to ignore. Hops are valuable in a planted aviary because they are self clinging and look after themselves. Russian Vine is popular with some breeders, but I feel that it is so dense that it is not the best plant to bring insects into range of the birds. Buffalo worms and mini-mealworms are always made available.

One of the problems of leaving the parent birds to collect their own wild livefood is that a change of weather can affect its availability. It takes only a rainstorm or a drop in temperature to make buds close more tightly and so make livefood less accessible. Every possible device must be used to increase the quantity and quality of livefood. The floors of my flights are layered with leaf mould collected from a local wood. This encourages insects to remain in the flight rather than going on nocturnal wanderings in search of better conditions. Grass cuttings and horse manure are placed around shrubs. This acts as a fertilising mulch to the plants which in turn provide the shade which many insects prefer when breeding.

A rotting fruit stack is invaluable. A local greengrocer saves boxes of unsaleable fruit for my birds. This is piled on the floor of the flight in a sheltered position so that it is not affected by direct rainfall. The amount of livefood, fruit flies and the like, generated by the stack is amazing. Grass cuttings, manure and fruit are turned over every couple of days to reveal insects and make them readily available to the birds. The carpet of leaf mould provides rootlets for nesting material.

At one time, I used to use branches with natural holes in them as nesting sites, but I now use well-used, discarded Budgerigar nest-boxes. These have the advantage of an inspection flap which permits me to remove chicks when they are five days old so that they can be hand-fed, by my wife, until they are self-supporting. Hand-rearing will be seen by some as a chore and, indeed, the task of feeding every half hour until 10pm and then starting again at 6.30am can be demanding, but it lasts for only a couple of weeks. When the fact that Redstarts have only one nest of eggs is taken into account, it is well worthwhile to avoid the possibility that the parents will not be able to gather enough livefood and so lose a whole year's breeding potential.

The hand rearing mixture consists of mini-mealworms, cleaned maggots (with reluctance due to the risk of botulism) and chrysalis to provide roughage. These are chopped up, on a board, with a Stanley knife, two drops of a multivitamin, such as Abidec, are added and pasteurised milk is used to make a paste. This is fed, as wet as possible, with a spatula.

Redstarts can be kept without a licence, but can only be sold under a special licence granted by the DOE, which needs to satisfy itself that the birds concerned have been bred, legally in captivity. If I can breed four or five Redstarts each year from my three pairs, I am very pleased. If more experienced Softbill breeders join the BBC breeding programme we could soon be in a position that there will be so many Redstarts available that it will be difficult to deny this beautiful British Bird a place on the show bench.

* * *

A REVIEW OF BIRD BREEDINGS AT CHESTER ZOO IN 1995

By Roger Wilkinson
(Curator of Birds)

1995 was a very good year for the Bird Department with 73 species of birds successfully reared from a total of 86 that hatched chicks. The highlights were our first successful breedings of Congo Peafowl *Afropavo congensis*, Wrinkled Hornbills *Aceros corrugatus*, Mauritius Kestrel *Falco punctatus*, and Golden Conures *Aratinga guarouba*.

The season actually began the previous December when the Emus *Dromaius novaehollandiae* began laying eggs which the male incubated over winter but no chicks were hatched. The Rheas *Rhea americana*, were more successful in that they hatched five chicks in July all of which were reared. Young female Red-necked Ostriches *Struthio camelus massaicus*, were received on loan from Cotswold Wildlife Park and from Fota Wildlife Park, Eire, and have recently been introduced to our older male.

Twenty-two Humboldt's Penguin *Spheniscus humboldti* chicks were hatched under their parents between late March and July. Of these twenty removed shortly after hatching were successfully hand-reared but two left under their parents failed to survive.

Following close on the arrival of two White Pelicans *Pelecanus onocrotalus* from Tierpark Berlin in 1994, we received a further three White Pelicans from Tierpark in 1995. Another White Pelican, a pair of Dalmatian Pelicans *Pelecanus crispus* and four European Spoonbills *Platalea leucorodia* were received in July from Jurong Bird Park, Singapore. Four more Spoonbills which arrived from Birdworld, Farnham, in October have joined the Black Storks, *Ciconia nigra*, (recently received from Munich Zoo and Cotswold Wildlife Park) in the main Waldrapp Ibis *Geronticus eremita* flight. Waldrapp Ibis reared young in this flight and also in the new "Europe on the Edge" aviary. Other birds nesting in "Europe on the Edge" included Little Egrets *Egretta garzetta*, Red-crested Pochard *Netta rufina*, White-headed Ducks *Oxyura leucocephala*, Marbled Teal *Marmaronetta angustirostris*, and Rock Doves *Columba livia*. Both the White-headed Ducks and Red-crested Pochard were successfully parent-reared providing extra interest for Zoo visitors.

Waterfowl reared elsewhere in the Zoo included Black-necked Swans *Cygnus melanocoryphus*, Hawaiian Geese *Branta sandvicensis*, Shelduck, *Tadorna tadorna*, Shovellers *Anas clypeata*, Tufted Duck *Aythya fuligula*, Rosy-billed Pochards *Netta peposaca*, Mandarin Ducks *Aix galericulata*, Carolina Ducks *Aix sponsa*, and Ruddy Duck *Oxyura jamaicensis*. We were particularly pleased to rear eleven West Indian Whistling Ducks *Dendrocygna arborea* from stock loaned to us by the Wildfowl & Wetlands Trust, Slimbridge.

The Caribbean Flamingos *Phoenicopterus ruber* hatched and reared four chicks, and the Chilean Flamingos *Phoenicopterus chilensis* reared five chicks of six hatched.

The Mauritius Kestrels laid a clutch of 5 eggs which they were allowed to incubate until a week after laying of the final egg. These were then removed to the incubator and replaced by dummies. Two chicks hatched but one was rather weak and did not survive. Following recommended protocol the remaining chick was returned to its parents at 9 days. The female rejected it attacking it in the nest. A second attempt at introducing the chick when 12 days old met with similar failure and we abandoned attempts at parent-rearing of this chick. One of the chick's wings was broken as a result of aggression from the female. This was set and subsequently healed without any indication of the previous injury. We were fortunate to learn of an orphaned chick Common Kestrel *Falco tinnunculus* handed in to Knowsley Safari Park. This bird was reared together with the Mauritius Kestrel to reduce the risks of human imprinting. The Common Kestrel was subsequently hacked back to the wild by staff at Thurstaston Country Park and the Mauritius Kestrel youngster is now living at the Tropical Bird Gardens, Rode. A second clutch of three eggs was left under the parents for full incubation but none of these hatched.

Three Bare-faced Curassows *Crax fasciolata* were reared. All three were females in contrast to 1994 when all five youngsters were males. One Variable Chachalaca *Ortalis motmot* was parent-reared but the breeding female died in early winter leaving only this youngster and its father in the collection. New to Chester were a group of Grey-headed Chachalacas *Ortalis cinereiceps* on loan from Banham Zoo. These are most quarrelsome amongst themselves even within the very large free-flight area of the Tropical House. However, they do not molest the other birds and their boldness makes them popular with our visitors.

Pheasants reared included Temminck's Tragopan *Tragopan temminckii*, Satyr Tragopan *Tragopan satyra*, Himalayan Monals *Lophophorus impeyanus* and Edwards' Pheasants *Lophura edwardsi*. New to the collection were a pair of Malayan Crestless Firebacks *Lophura erythrophthalma* received on loan from Hamerton Wildlife Park. Other new arrivals included a pair of Green Peafowl *Pavo muticus*, and a pair of Ocellated Turkeys, *Agriocharis ocellata*. Common Peafowl, *Pavo cristatus* were allowed to parent-rear chicks on the paddocks but the most important breedings in 1995 were those of Congo Peafowl.

A new pair of Congo Peafowl received from Antwerp Zoo in February 1995 quickly settled down in their aviary in the Tropical House and a first clutch of three eggs were laid in mid-April. These eggs were removed for artificial incubation and then transferred to be put under a bantam prior to hatching. Two chicks were hatched and both successfully reared under the

foster. A second clutch of three eggs laid in mid-May were removed for artificial incubation, replacing these eggs with dummies. Before hatching the eggs were returned to the female. Three chicks hatched but one died shortly after hatching. Because of concerns over possible sand ingestion and impaction the parents and chicks were later moved together to a small adjacent holding area with a plastic matting floor and held there for three weeks before return to the main aviary.

The Red-crowned Cranes *Grus japonensis* which reared two chicks in one brood in 1994, hatched only one chick in 1995. This was again parent-reared; the seventh to be reared from this pair and the sixth parent-reared. Infertile eggs were again laid by the Wattled Crane *Buceros carunculatus*, resulting in the decision to try her with a different male in 1996. An exchange of males with the Tropical Bird Gardens, Rode, has now resulted in renewed hopes for fertile eggs next year.

The female Sun-Bittern *Eurypyga helias* received from Bourton-on-the-Water in 1994 was tentatively introduced to the aviary with the two males in 1995. These two males had been living together since 1969 and it was hoped that the female would select one of these for a partner. In the event, one of the males was found dead, believed killed by the other male. The surviving male and female went on to build a small mud platform and line this nest with moss but no eggs were laid. The female is thought to be over twenty-five years old and perhaps we should not be over optimistic as she may now be too old to lay.

One Crowned Plover *Vanellus coronatus* was reared but unlike the over-prolific Rock Doves in "Europe on the Edge", neither the Stone Curlews *Burhinus oedichnemus* nor Avocets *Recurvirostra avocetta* showed any indication of nesting.

Nicobar Pigeons *Caloenas nicobarica*, Superb Fruit Doves *Ptilinopus superbus*, Jambu Fruit Dove *Ptilinopus jambu*, Speckled Pigeons, *Columba guinea* and Diamond Doves *Geopelia cuneata* were bred. We still await success with our Pink Pigeons *Columba mayeri*, and with the Blue Crowned Pigeons *Goura cristata*. Both species laid in 1995, the Blue Crowned Pigeons for the first time at Chester. Although their first eggs were infertile, the last, more encouragingly, was fertile but failed to hatch. Most of the Pink Pigeon eggs were infertile, and the few fertile eggs broke down very early during incubation.

Yellow-backed Chattering Lories *Lorius garrulus flavopalliatu*s, Musschenbroek's Lorikeets *Neopsittacus musschenbroekii*, and Stella's Lorikeets *Charmosyna papou goliathina* were bred. However, the year ended badly with the death of the breeding female Musschenbroek's Lorikeet, leaving us with four males, including the breeding male, but without females.

The female Palm Cockatoo *Probosciger aterrimus* spent several weeks in the nest-log early in the year but no eggs were laid. Later in the year the

pair had to be separated because of aggression from the male, probably a result of him entering breeding condition before she was ready. A second pair of Palm Cockatoos and two male White-tailed Black Cockatoos *Calyptrorhynchus latirostris* were received on loan from HM Customs and Excise. The former were confiscated from an Eastern-European ship docked in Glasgow and the latter suggested to have been smuggled into the UK as eggs.

Six Blue-eyed Cockatoos *Cacatua ophthalmica* were sent on loan to other collections and three more bred in 1995. Sadly one of our original females received at Chester Zoo in 1966 died after 29 years in the collection. No chicks had been reared from this female for fifteen years and she had recently been paired to a male that was also poorly represented by offspring. It was then all the more concerning that she died leaving an egg in the nest box. This egg was removed for artificial incubation and the chick was hand-reared. This hatching occurring after the death date of the female parent caused considerable problems for our computer's logic but great satisfaction and relief to ourselves! Other parrots reared included a female Vosmaeri Eclectus Parrot *Eclectus roratus vosmaeri* hatched very early in the year and subsequently sent on loan to Paradise Park, four Greater Vasa Parrots *Coracopsis vasa*, now at Edinburgh Zoo and Paultons Park, and two Derbyan Parakeets *Psittacula derbyana*. The Red-fronted Macaws *Ara rubrogenys* which reared five chicks in 1994, reared a brood of four in 1995. Two Blue and Gold Macaws *Ara ararauna*, were reared and a female Blue-throated Macaw *Ara glaucogularis* was received on loan from Loro Parque to pair with Chester's male. Four Green-checked Amazon Parrots *Amazona viridigenalis* were reared by their parents. The female Cuban Amazon *Amazona leucocephala* was seriously attacked by her male partner during the incubation period and the pair had to be separated and their eggs removed for artificial incubation. Three chicks were hatched and successfully hand-reared. A female Red-tailed Amazon *Amazona brasiliensis* was received on loan from Loro Parque and has now been paired with a male on loan from Paradise Park, Hayle. We are very pleased to have the opportunity to work with these endangered Amazons at Chester.

The Golden Conures *Aratinga guarouba* hatched a chick in 1994 but lost it shortly after hatching. It was therefore decided to remove their first clutch in 1995 for incubation and hand-rearing. Only one of three eggs of the first clutch was fertile but this was successfully hatched and hand-reared. The second clutch comprised three eggs, two of which were fertile. One hatched by the parents died on the first or second day after hatching; the second was removed to the incubator for hatching and hand-reared. The first of these chicks was introduced to its parents when five months old. The parents were alarmed at first but soon interacted with, and became very protective of the youngster behaving as if they had themselves reared the chick. The second has recently been introduced to this "family group". One

pair of Blue-throated Conures *Pyrrhura cruentata* hatched three chicks but very disappointingly all three died at three weeks old with post-mortem indicating *Klebsiella*. The Slender-billed Conures *Enicognathus leptorhynchus* again reared four chicks and one Thick-billed Parrot *Rhynchopsitta pachyrhyncha* was hatched and reared by its parents.

The Red-crested Touracos *Tauraco erythrolophus* hatched a chick but failed to rear it; another hatched in the incubator was successfully hand-reared. One Violaceous Touraco *Musophaga violacea* was reared by its parents and two more were hand-reared. The breeding pair of Schalow's Touracos *Tauraco schalowi* were both lost through pseudotuberculosis in March leaving us with only two males. Foreshadowing our experience with the Blue-eyed Cockatoos, an egg recently laid by the Schalow's was saved from the nest and artificially incubated and hand-reared. With uncharacteristic good fortune this youngster proved to be a female and has now been paired with one of the males.

Only one Spectacled Owl *Pulsatrix perspicillata*, but four White-faced Scops Owls *Otus leucotis*, two Snowy Owls *Nyctea scandiaca*, and two Barn Owls, *Tyto alba*, were reared. As in previous years, the Barn Owls were donated to the Keele University Barn Owl release scheme and research project now being supervised jointly through Keele University and Chester Zoo. The Ferruginous Pygmy Owls *Glaucidium brasilianum* laid infertile eggs. The Great Grey Owls *Strix nebulosa* and Milky Eagle Owls *Bubo lacteus* have yet to show any interest in breeding and we have had no success in finding a mate for our single female Vermiculated Fishing Owl *Scotopelia bouvieri*. Four Tawny Frogmouths *Podargus strigoides* were hand-reared but one that hatched under the parents died at 4 days old. Attempts at returning older hand-reared chicks to the parents proved unsuccessful in that although they were brooded and defended by the nesting female, they were not fed by the adults.

A pair of Blue-crowned Motmots *Momotus momota* which share the central aviary of the Bird House with four Scarlet Ibis *Eudocimus ruber* successfully reared a chick for the first time at Chester. Trumpeter Hornbills *Bycanistes buccinator* fledged one chick and two more African Grey Hornbills *Tockus nasutus epirhinus* were reared. When first bred at Chester in 1989 and 1988 respectively, the breeding of these hornbills caused considerable interest but neither was as important as the fledging of the four Wrinkled Hornbills *Aceros corrugatus* in 1995. A separate account of this breeding has been prepared for the *Avicultural Magazine*. The Great Indian Hornbills *Buceros bicornis*, again nested without success and we await a first breeding attempt from the Rhinoceros Hornbills *Buceros rhinoceros*. A new female Rhinoceros Hornbill, hopefully more interested in our male, has now been received on loan from Lotherton Bird Gardens with our female transferred to Lotherton. This also should work better in that in the shape of her casque the new female more closely resembles

the male whose flat casque indicates he is of the Javan race *Buceros rhinoceros silvestris*.

Chessington Zoo most generously loaned a male Toco Toucan *Ramphastos toco* now paired with our female. Lesser Green Broadbills *Calyptomena viridis* are new to the collection with five established birds, two males and three females, received from three different sources. Red-eared Bulbuls *Pycnonotus jocosus*, Fairy Bluebirds *Irena puella*, and Asian Glossy Starlings *Aplonis panayensis*, were reared in the free-flight area of the Tropical House. Other softbills bred included Red-billed Magpies *Urocissa erythrorhyncha*, Azure-winged Magpie *Cyanopica cyana*, and Superb Spreeo Starlings *Spreo superbus*. One fledgling from a first brood of Spreeo Starlings was seen carrying food to the second brood nest in this way mirroring the co-operative behaviour of helping at the nest observed in the wild.

One of the most satisfying results of the 1995 breeding season was the rearing of eleven Rothschild's Mynahs *Leucopsar rothschildi*. We retained three young Rothschild's Mynah that had been reared at Chester in 1994 to split previously unsuccessful pairs. New pairs were made up as combinations of older birds with yearlings. In 1995 this proved successful only for the pair which comprised an older male and young female. Four clutches laid by this young female resulted in nine chicks of which five were successfully reared. Although the other two newly formed pairs were very active and continually courting and nest-building only one of the females laid and no chicks were hatched from either pair.

Finally we should not lose sight of a small collection of birds in our Finch Flight. Chinese Painted Quail *Excalfactoria chinensis*, Mexican Housefinches *Carpodacus mexicanus*, Red-billed Firefinches *Lagonosticta senegala*, Red-cheeked Cordon-Bleu *Uraeginthus bengalus*, and Bicheno Finches *Poephila bichenovii* hatched chicks but not all were reared. Gouldian Finches *Chloebia gouldiae* fledged two chicks in this outside aviary in mid-October.

Even in December a few birds were still breeding. Two more Speckled Pigeons fledged in the warmth of the Tropical House and four more Humboldt's Penguins hatched by the parents were taken for hand-rearing. An Eclectus Parrot hatched in mid-December was left with its parents which we are hoping may be able to rear it despite the cold, wintry weather.

Many avicultural challenges remain and we look forward to meeting some of these in 1996 perhaps by breeding species for which success has so far eluded us at Chester. We must also continue working towards providing conditions under which birds will rear their own young without our assistance. Only then can we begin to meet the requirements of conservation breeding that we have set as one of our main aims at Chester Zoo.

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